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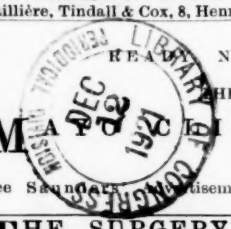


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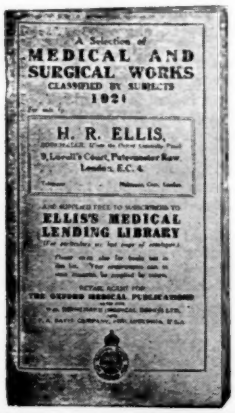


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# A Discourse
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BY H. J. HAMBURGER, SC.D., M.D., LL.D., F.R.S.,
PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF GRONINGEN (HOLLAND).

## I. INTRODUCTION: SOME HISTORICAL REMARKS.

THE problem of permeability plays a fundamental rôle in physiology as well as in pathology and pharmacology. For permeability means a power of admitting certain substances into the cell and of excluding others, and thus in physiology and pathology we endeavour to substitute for the mysterious principle of "conscious selection" of cells towards some substances, and for the so-called "vital activity," simple physical and chemical factors, no matter how complicated the coöperation of these factors may ultimately prove to be. This means also in pharmacology the finding of those forms of drugs which by penetrating into the interior of the cell are able to be of use there.

As an example, let us consider the acinus of the salivary gland. From the outside the epithelial cells are supplied with nutritive materials from the blood, while from the side next the lumen the saliva is secreted. The neo-vitalist has a simple explanation for this. According to him, the cells of the salivary glands take up, actively and selectively, substances from the blood, and secrete saliva through the so-called physiological motive force. If he introduces a salt solution into the alimentary canal, it is again the physiological vital force, an attribute of the living cell alone, that brings about the absorption. For, if the epithelium be injured by a poison, the process of absorption is entirely altered: this, he says, is because the dead epithelium lacks the physiological motive force. The same line of argument is sufficient for him to explain secretion and absorption in any part of the body. The neo-vitalist, it is true, freely acknowledges that physical factors also play a part in secretion and absorption, but the fundamental principle of these processes is a specific attribute of the living cell alone.

But what does this term "physiological motive force," so often used by Heidenhain, and by many after him, imply? Only this: we do not know and have to abide by that. It appears to me, however, that it is the duty of the biologist to endeavour at least to explain the phenomena along physical and chemical lines. Is it not probable that in the formation of saliva the cells by virtue of their properties of permeability allow the permeation of certain foodstuffs from the blood? That they convert these by chemical action and allow the products—namely, the saliva—to pass out at the other end, aided probably during this process by electrical currents, the cataphoresis? Such lines of thought appeal more to the modern physiologist than the idea that the cell, according to its needs, takes up actively, by virtue of a vital power, the necessary elements from the blood and discharge these into the lumen of the acinus. Some think that this physico-chemical explanation is much too simple and that the delicateness of the processes of life are thereby ignored. Yet upon more thorough investigation this proves not to be so, and one becomes more and more impressed by the marvellous intricacy and efficiency of these physico-chemical processes, while the number of unsolved questions continually increases.

I could add to these two examples, where permeability must play an important part, a great many others; but a detailed discussion would practically involve the whole of physiology. I shall be obliged, therefore, to limit my discussion to a few illustrative examples. In the choice of these I shall, while regardful of the *suum cuique*, also refer to my own work which, alas, has of late been too often overlooked. Who is there, however, of the senior among us who has no reason to complain of neglect? Moreover, these lectures are, I think, expected to have a personal flavour, and it is better so.

The study of the permeability of the animal cell may be said to have been introduced by researches which I carried out in 1889.[1] These investigations arose from my work in 1883 on the influence of salt solutions on the escape of colouring matter from the red blood corpuscles.[2] A year previously[3] (1882) the well-known botanist Hugo de Vries had conducted experiments upon the force with which plant cells attract water. He employed three biological methods, of which the plasmolytic gave the most reliable results. This method consisted in using a salt solution strong enough to bring about a slight separation of the contents of the plant cell from the cell membrane—in other words, to induce plasmolysis in the cell. This separation of the protoplast from the membrane (plasmolysis) was due to the fact that the water-attracting power of the surrounding fluid was something greater than that of the cell-contents. Hence de Vries concluded that solutions of any salts which caused the same degree of shrinkage when acting upon the same cell must have identical water-attracting powers. He called such solutions, having identical water-attracting powers, *isotonic* solutions: and the simple relations which appeared to exist between the concentrations of such solutions of different salts he named their isotonic coefficients. De Vries thus regarded the protoplast as semi-permeable—in other words, perfectly permeable to water but impermeable to substances dissolved in it. In the following year now (1883) I investigated the question whether the same phenomena which de Vries had observed in the plant cell applied also to the animal cell.[2]

I chose the red blood corpuscle as my material. The first step was to try to find a concentration capable of inducing plasmolysis in these cells. But I failed to find it. No plasmolysis could be observed in my experiments. Then I turned to the study of the escape of coloured matter from the red corpuscles. And so it was found that the red blood corpuscles were also subject to the law of isotonic coefficients. Between the concentration of salt solutions causing the escape of coloured matter from the same blood corpuscles the same numerical relation appeared to exist as between the concentration of salt solutions inducing plasmolysis in the same plant cell. These investigations on the blood corpuscles, as you no doubt recollect, marked the beginning of modern physico-chemical research in the medical sciences.

It may be observed in passing that it has repeatedly been stated that Van't Hoff's theory of osmotic pressure laid the foundation for these investigations on the blood corpuscles, but this is decidedly a mistake. The real basis for my work was given in de Vries's researches in plant physiology of 1882. These investigations and my own hæmatological researches furnished important data for an experimental proof of Van't Hoff's theory, which was based principally on thermodynamic considerations and on Pfeiffer's researches. Besides, Van't Hoff's theory was published for the first time two years later, in 1885,[4] and absolutely needed Arrhenius's theory of electrolytic dissociation (1887)[5] as a supplementary one to be accepted.

As already mentioned, I found that for every salt a concentration could be obtained in which the least resistant blood corpuscles lost their colouring matter, and in these concentrations the salts had the same power of attracting water. How could this phenomenon be explained? Could it be possible that these salt solutions, which had the same power of attracting water, brought about a slight shrinkage as in the case of the plasmolysis of plant cells? This

could hardly be accepted. It was more plausible that the salt solutions used caused a swelling which a number of the blood corpuscles could not withstand without losing their colouring matter. If this assumption were true, then it would follow that the serum of blood could also be diluted with water without the occurrence of hæmolysis. This, indeed, proved to be the case. The serum of animals could be diluted with percentages of water up to multiples of ten, that of man with 50 per cent. and more before colouring matter was discharged, and the conclusion was that a diluted serum which just caused hæmolysis to set in was isotonic with a salt solution which could do the same. A simple calculation now showed that the blood serum of the majority of warm-blooded animals, including man, was isotonic with a NaCl solution of 0·9 per cent., and not of 0·6 per cent., as was generally thought at the time, and which had always been called the physiological NaCl solution. In connexion with this I therefore introduced the terms *hyperisotonic* and *hypoisotonic*, according as the solutions had respectively a stronger or weaker power of attracting water than normal serum. All this was proved by determination first of the corpuscular volume[6] and afterwards of the freezing-point. I, and after me Hedin[7] and others, found that the blood corpuscles shrink in hypertonic and swell in hypotonic solutions. I considered, and so did they, that the blood corpuscles, like the plant cells of de Vries, were semi-permeable, and thus allowed only water to pass through.

## II. Permeability of Red Corpuscles to Electrolytes (Anions and Kations).

Experiments by quantitative chemical methods in 1889[1] convinced me quite unexpectedly, however, that this was not the case—in other words, the blood corpuscles were not semi-permeable. For when they were mixed with a salt solution which was isotonic with the serum their volume, it is true, remained unchanged, but they lost chlorine, and, as I was able to demonstrate afterwards, an interchange took place between the contents of the red corpuscles and their environment. The elimination of chlorine was especially studied. Through these researches the question of permeability was introduced for the first time, and since then permeability has been a prominent item on the programme of large numbers of physiological inquiries. When we come to think of it, it is somewhat remarkable that it had not been earlier realised that permeability to dissolved substances is necessary for the life of cells, whether for the assimilation of nutritive substances or for the elimination of waste products. Yet it was only with difficulty that we succeeded even in recent times in getting the idea of permeability, to inorganic substances for instance, universally accepted.*

After the permeability of blood corpuscles to chlorine was established in 1889 I was able in 1892[2] to offer additional proofs. I inquired whether, seeing that the hæmolysis of the red corpuscles is so sensible to slight modifications in the concentration of the surrounding fluid, the erythrocytes of the arterial and venous blood of the same animal would show any difference in respect to the salt concentration at which colouring matter was discharged. Such a difference proved to exist; the carotid blood of a horse showed commencement of hæmolysis in a NaCl solution of 0·61 per cent., the jugular blood, on the other hand, had already hæmolysed in a NaCl solution of 0·62 per cent. This fact was the starting-point of a new series of investigations on permeability. On the assumption that this phenomenon was in some way connected with the carbon dioxide concentration, we investigated the influence of $CO_2$ on the loss of colouring matter. This influence proved to be very great, and led to the study of the influence of carbon dioxide on the distribution of the constituents of the blood between corpuscles and serum. In the first place, it appeared that when blood was treated with a quantity of carbon dioxide, which was well within physiological limits, an interchange of constituents took place between blood corpuscles and blood serum. If the carbon dioxide was driven out the original partition was fully restored; the phenomenon was a reversible one, and the conclusion was drawn that it must be of importance to life. For while the blood flows through the capillaries of the tissues it is acted upon by carbon dioxide, and when it reaches the lungs the carbon dioxide is expelled again. Of the changes which carbon dioxide brings about in the distribution of the blood constituents between the blood corpuscles and serum the most important was a transit of chlorine into the corpuscles and an increase of alkalinity—that is, in the amount of diffusible alkali of the blood serum.† There was also a considerable swelling of the blood corpuscles. With every act of respiration, therefore, rhythmical changes take place; while the blood circulates through the tissues the blood serum becomes more alkaline, poorer in chlorine and phosphoric acid, and poorer in water. Owing to the latter the concentration of albumin and other organic substances in the plasma increases. When the blood reaches the lungs again the carbon dioxide is expelled and the partition of the constituents is as before. These results can be confirmed by comparative experiments on normal carotid and jugular blood. It would carry me too far if I were to enter upon the significance of these phenomena in metabolism. It is obvious that in venous congestion the interchange between blood corpuscles and plasma is much more pronounced than in the normal circulation.

These various facts about $CO_2$ were useful to British and American investigators during the war. It may be observed that they have also formed the basis for the well-known researches of Korányi on the diagnosis and treatment of heart diseases.[11] This investigator has shown how an uncompensated heart disease can be differentiated from renal insufficiency. In both cases the lowering of the freezing-point of the blood serum is increased, in the case of the heart disease through the accumulation of carbon dioxide, and in the case of renal insufficiency through the accumulation of waste products. In both cases a decrease in the amount of chlorine in the blood plasma is observed. To distinguish between these two diseases Korányi suggested that oxygen should be passed through the blood drawn from the patient. If it is a case of uncompensated heart disease, then there is an increase of chlorine, and also the freezing-point of the serum becomes normal again. If these phenomena are absent then the diagnosis is renal insufficiency. Korányi also worked on the same lines in the therapeutic direction. In cases of uncompensated heart disease he administers oxygen: the surplus of carbon dioxide disappears, and with it the cyanosis. The blood undergoes the same changes which are observed in vitro when oxygen is passed through; thus the blood corpuscles surrender water to the plasma, with the result that the percentage of chlorine increases. It is obvious that in consequence of this dilution of the plasma with water the viscosity of the blood will diminish and the circulation be improved. This improvement of the circulation serves a double purpose: firstly, the blood of the coronary system will feed the heart better than when the flow of blood is slow on account of the great viscosity of the plasma. The improvement in the circulation is shown by the kidney function. The diuresis increases, and this is further facilitated by the increased amount of chlorides in the plasma. The special value of the oxygen inhalation is seen in the fact that through the improved action of the

* It may be remarked en passant that in the literature one repeatedly comes across the idea that the question of permeability originated in the lipoid-theory of Meyer-Overton.[5] This theory, however, only appeared in 1899, ten years later, and its sole object was the study of the conditions under which organic substances could penetrate the wall of the cell. According to that theory, as you know, this penetration is considered to be subject to the solubility of the substance which is experimented with in the lipoid cell-surface.

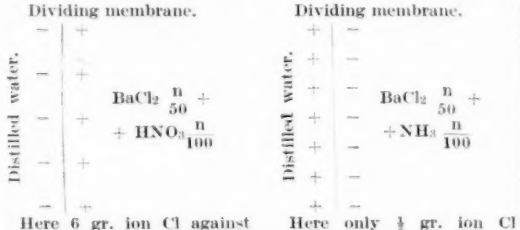
† An increase of the amount of alkali in the serum had been already seen by Zuntz[10] in *saturating* blood with $CO_2$.

heart and the increased diuresis the œdema disappears; what is especially remarkable is that the beneficent after-effects of oxygen inhalation last for so long a time. The recent researches of Yandell Henderson[12] on shock, acapnia, ether-anæsthesia, are also based upon my experiments on the interchange of substances between red corpuscles and the environment.

My experiments on the effect of carbon dioxide on permeability gave rise to the question whether the carbon dioxide as such or as an acid caused the interchange of constituents. The latter was the case, because other acids also brought about the same interchange, while addition of alkali to the blood had the reverse effect. Afterwards, in 1901, it appeared to me that we have here a general principle, for not only red corpuscles but also white blood corpuscles and other isolated cells suspended in their natural media showed a swelling in carbon dioxide and other acids and shrinking in traces of alkali;[13] also organs as a whole showed the same phenomenon. In this way a considerable swelling of the kidneys was demonstrated with the plethysmograph when a trace of acid was added to the blood and a shrinkage when the blood was treated with a little alkali.[14] In 1906 the Belgian physiologist Demoor obtained the same results.[15]

Although stress has been laid upon the permeability of the blood corpuscles to chlorine they appear to be permeable also to other acid radicals, as, for instance, to $SO_4$,[16] $NO_3$, and phosphoric acid. This can be demonstrated by quantitative chemical methods more clearly with blood corpuscles which have been treated with $CO_2$ than with arterial blood. I shall not dwell now upon the explanation of this fact. Only one remark. The objection has been made that the $CO_2$ had harmed the blood corpuscles so that they were no longer normal. This is not justified, however, because the amount of $CO_2$ which was added to the arterial blood was not necessarily beyond the physiological quantity, and, moreover, because the process was totally reversible.

Up till now we have considered the permeability of blood cells to Cl and other anions. Are they also permeable to kations—i.e., to metals? Investigations made in our laboratory[17] afterwards proved that, when a little water or a little salt is added to the serum there is also an interchange between the kations of the corpuscles and those of the surrounding fluid. Or, to put it generally, we observed that every disturbance of the osmotic chemical equilibrium causes an interchange of kations, as well as of anions between the blood corpuscles and their environment. The metals experimented with were Na, K and Ca. All these interchanges are intensified when $CO_2$ or other acids are added. Kœppe[18] and myself[19] gave an explanation for these facts, which has been almost universally accepted. I shall not dwell upon this question, but I only wish to draw attention here on the experiments of Girard[20] with simple membranes, which are very instructive.




Here 6 gr. ion Cl against 1 gr. ion Ba are diffused into the distilled water in 20 minutes.

Here only ½ gr. ion Cl against 1 gr. ion Ba are diffused into the distilled water in 20 minutes.

When a solution of barium chloride, mixed with a little ammonia or $HNO_3$, is subjected to diffusion against distilled water, the relative quantities Cl and Ba which pass through the polarised membrane during the same length of time are very different, as the above scheme shows.

Without polarisation of the membrane there had to be a diffusion of 1 Ba against 2 Cl. Hence the conclusion may be drawn how considerable must be the effect of hydrogen-ion concentration on the partition of the constituents of corpuscles and serum.

In cells the circumstances are more complicated than in the schema of Girard. I think here of the interchange in tissues between fixed cells and fluids which are in motion—e.g., here the principle of the initial rate of osmosis, studied by Lazarus Barlow[21]—is to be taken into account.

So far we have considered especially the permeability to salts and their components, the electrolytes. Very likely the question may be put whether this can be justified and whether the electrolytes have indeed such a great significance. My answer to this is that, in the first place, the salts or their ions, by virtue of their water-attracting properties (osmotic pressure), exert an important effect on the passage of fluid between the cell and its surroundings; secondly, they strongly influence the state of colloid dispersion, and therefore the viscosity of fluids and cells. We recall here inter alia the influence of the motility of the cell-contents on cell division and fertilisation.

### III. Permeability to Non-Electrolytes (Organic Substances).

Let me now direct attention to the organic substances. Gryns has divided organic substances into those that can enter blood corpuscles and those to which the blood corpuscles are impermeable.[22] According to him, they pass through if they cause hæmolysis when in isotonic concentration; if not they are held back. Such a representation of the matter was much too schematic, because several substances which thus appeared unable to pass through as a matter of fact did so, but only slowly. The permeability to organic substances has been investigated also by a method employed by Hedin to study the red corpuscles, and by Overton to study the cells of plants. On the whole there appears grosso modo to exist a correspondence between the permeability relationships of red corpuscles and those of plant cells; but Overton's idea, as stated in 1907,[23] that all the known permeability relations of plant cells can be applied equally well to animal cells and even to all animal cells is certainly wrong. To whom, in fact, will it be surprising, that, for example, a great number of organic substances which are able to pass through the intestinal epithelium are held back by the epithelium of the bladder? Indeed, the intestinal epithelium would poorly answer its purpose as an organ of absorption if it were impermeable, and the bladder epithelium would be a bad lining for a reservoir for metabolic waste products if it were to allow substances to pass through it. It is not at all immaterial for which kind of cell the permeability is determined, neither is it immaterial which substance is concerned in the investigations of the permeability of one and the same cell.

We shall now briefly consider the permeability of cells other than red corpuscles.

### IV. Permeability of Cells other than Red Corpuscles.

A glance at the history of the study of permeability reveals the fact that blood corpuscles were mostly employed. This is, firstly, because it is possible to obtain the blood corpuscles in an isolated and undamaged condition in contradistinction to most other cells. Secondly, the influence of reagents on volume and shape and on their chemical and physicochemical composition can be investigated. Thirdly, one is able, by the addition of definite substances—the amount of these substances being within physiological limits to the natural medium—to make accurate quantitative observations on the interchange of constituents between the corpuscles and the serum. Bacteriology has contributed much to this interest in blood corpuscles. Who does not in this connexion think of what happens after the

injection of foreign blood corpuscles, of complement-fixation, hæmolysis, agglutination, and so many other things? But also vice versa, and this is worth repeating, the study of the osmotic relationship of the erythrocytes was indispensable for the correct application of red corpuscles in the researches on immunity. It is owing to the above-mentioned advantages of the red corpuscles that the results obtained with them have repeatedly been the guides to important researches on cells and tissues which can only with difficulty be examined. We can also mention other cells which have the same advantages as the red corpuscles—namely, the white corpuscles; for these also are cells which can be easily examined in an isolated condition in their natural environment. But outside my laboratory they have, unfortunately, scarcely been examined as to their permeability. This is the more unfortunate because in the phagocytic power one has an excellent means of making accurate quantitative observations on life, or rather on one of the vital attributes of life, after the equilibrium has been disturbed by the addition of definite substances to the medium. I have outlined in a monograph (1912) some of the interesting results which can be obtained from a study of these cells.[24]

Of the isolated cells, which have been examined by me in a manner similar to that used for the red corpuscles on their osmotic behaviour towards salt solutions, can be mentioned spermatozoa, lymph gland and epithelial cells, the parenchymous cells of the liver, spleen and kidney, and also the nuclei of all these cells, but I cannot expatiate here on these.

I will now go over the question as to whether the permeability is constant for one and the same kind of cell.

## V. THE PERMEABILITY CHANGES (VITAL PERMEABILITY).

It is now some 20 years since I pointed out for the first time that the permeability of one and the same kind of cell has no constant value, but is dependent on the physiological conditions of these cells.[1]

1. *Influence of $CO_2$, Acids, and Alkalies on Red Corpuscles.*—As already mentioned, I stated in 1892 that the permeability of red and white corpuscles changes quantitatively in a rhythmic way with every act of respiration. Snapper also demonstrated (1912)[25] in my laboratory by purely chemical experiments that the permeability of red corpuscles is changed by the influence of traces of sulphuric acid, and also in diseases, accompanied by fever, especially in pneumonia.

2. *Influence of $MgSO_4$ on Intestinal Epithelium.*—Further, in 1898,[26] I was able to show that intestinal epithelium with great difficulty allowed of the passage of common salt after it had been in contact with a solution of magnesium sulphate.

3. *Experiments on Permeability of Glomerular Membrane to Glucose.*—These experiments demonstrated the variable permeability to inorganic substances. Of late years, however, experiments have been performed in my laboratory with organic substances, more especially with glucose and its isomers and stereo-isomers. These experiments chiefly dealt with the permeability of the glomerular epithelium to these substances and the profound influence which is exercised on it by very minute physiological changes in the liquid flowing through the glomerular capillaries. I shall try to deal with the subject in a chronological order.[27] Since the time of Claude Bernard it has been known that though sugar is never absent from the blood it rarely appears in the urine of normal individuals. What is the cause of this, and why does sugar not appear in the urine until its amount in the blood exceeds a certain limit? Several possibilities have been considered. I shall not dwell on these; I only wish to point out that discussions on these possibilities have not reckoned with the fundamental question whether the kidney allows free glucose to pass through or not. Experiments were made with perfused kidneys; to ensure that the perfusing liquid contained sugar exclusively free and not as a colloidal compound a Ringer's solution containing sugar was taken. If the concentration of sugar in the artificial urine formed was the same as that of the original perfusing liquid the conclusion could be drawn that the kidney is permeable to glucose. After this it could be determined whether addition of serum causes a retention of sugar. Should this be the case, it would be practically certain that there is present in the serum a substance which binds the sugar in a form that the glomerular epithelium does not allow to pass through, and eventually it could be investigated what the substance in the serum is. With these investigations Dr. R. Brinkman and I have kept ourselves busy for more than two years; through them we have come to the most unexpected results, which now and then led us into side-tracks which were important in themselves.

Frogs were exclusively used for the experiments; the kidneys were perfused through the aorta at a pressure up to 60 cm. with Ringer's solution (NaCl 0·6 per cent., KCl 0·01 per cent., $NaHCO_3$ 0·02 per cent., and $CaCl_2$ 0·02 per cent.) containing 0·05 per cent. of glucose. Approximately 150 c.cm. passed through the kidneys per hour.

The urine is formed in the glomeruli. To grasp this a knowledge of the circulation in the frog is needed; in contrast to what we find in warm-blooded animals, the renal arteries supply the glomeruli, and to a very small extent the tubules, which get their blood-supply almost wholly from the renal portal vein which carries off the greater part of the blood from the hindquarters. It now appears that if a liquid is made to flow through this latter vessel under a pressure of 60 cm. not a drop of urine is excreted. Excretion takes place only under a much higher pressure, and even then very slowly. It is therefore clear that in our experiments, where the liquid flows through the renal arteries, the urine is derived from the glomeruli.

The fact that it is possible thus functionally to separate the contents of the glomeruli and the tubes so well from each other makes the frog an admirable object for the study of the formation of the urine, and British authors are very well acquainted with this fact. In our earlier experiments the percentage of glucose in the urine and the perfusion liquid was always the same. These results were also obtained after ligature of the renal portal vein. It was therefore obvious that the urine obtained was a purely glomerular filtrate so far as glucose was concerned, and that the glomerular membrane was permeable to glucose.

But further experiments made it doubtful whether the usual Ringer's fluid was the physiological one for the perfusion of the kidneys. Systematic changes in the fluid taught us that for the permeability of the glomerular membrane the concentration of the free calcium-ions and of $NaHCO_3$ are factors of preponderant importance, and that in using the right concentrations the urine was free from sugar; in other words, the glomerular membrane now showed itself impermeable to physiological quantities of glucose. As regards the concentration of the $NaHCO_3$, its proportion in the usual Ringer's solution is too low. No glucose was retained in the absence of $NaHCO_3$. It is known that one function of $NaHCO_3$ is to preserve a certain alkalinity in the body fluids. The sodium phosphate and sodium protein also take part in this. In this connexion these substances are consequently called tampons, buffers, regulators, or moderators. Most investigators in their perfusion liquids use 0·02 per cent. $NaHCO_3$, but it appears to us that this concentration is too weak for perfusion through the frog's kidney, for if to the solution made up of NaCl 0·6 per cent., $NaHCO_3$ 0·02 per cent., KCl 0·01 per cent., and $CaCl_2$ 0.0075 per cent. a little neutral red is added, then although the perfusion liquid is alkaline the urine becomes acid. The normal urine of the frog shows a weak alkaline reaction with neutral red. The buffer concentration of 0·02 per cent. was thus too weak to keep the urine reaction a weak alkaline one. But what is still more important, the retentive powers of the kidneys for sugar grow considerably weaker and finally disappear altogether. Clinicians will immediately think of the relation existing between acidosis and glycosuria.

We then determined the alkalinity of the frog's serum by titration with neutral red paper as indicator (Snapper). This corresponded to a $NaHCO_3$ solution of 0·285 per cent., and consequently a Ringer's solution was made with the following composition: NaCl 0·5, KCl 0·01, $NaHCO_3$ 0·285, $CaCl_2$ 0·015 per cent. The urine now was perfectly free from sugar and was no longer acid. These results have been fully confirmed by Bahlmann (1920).[28] Hence the glomerular membrane has the power of retaining free glucose, and this power is governed by the chemical composition of the perfusion liquid, which cannot be that of

the usual Ringer's fluid, but must be NaCl 0·5 per cent., $CaCl_2$ 0·02–0·04 per cent., KCl 0·01 per cent., $NaHCO_3$ 0·285 per cent.

As to the amount of calcium chloride, it may be emphasised that the percentage of this salt may be much greater than 0·02 per cent., provided the concentration of the Ca-ions be the right one. And this concentration is fixed by the following formula (Rona and Takahashi[29]):

$$\sqrt{[\overline{Ca^{\cdot\cdot}}]'} = K \cdot \frac{[H^{\cdot}]}{[HCO_3']}, \text{ where } K = 350.$$

The $[H^{\cdot}]$ can be kept constant in the artificial perfusing liquid by the addition of a small quantity of $CO_2$ and a little neutral red. The colour to be obtained in this way must be the same as in a definite mixture of primary and secondary phosphates, as was pointed out by Sörensen.[30] The concentration of $[HCO_3']$ depends on the amount of $NaHCO_3$, and this amount can be determined by titration of the normal serum. It is obvious that in this way an increase of the concentration of the calcium salt does not affect the concentration of the free $[Ca^{\cdot\cdot}]$, and, as already stated, the latter is of predominant importance.

The significance of the concentration of free Ca-ions for the permeability of cells other than the epithelium cells of the glomeruli is also evident from experiments conducted in our laboratory on the red corpuscles of man and other warm-blooded animals (Brinkman and Van Dam[31]). When red corpuscles are washed in 0·9 per cent. solution of NaCl they lose some of their colouring matter after again adding a 0·9 per cent. solution of NaCl. But this can be prevented if a definite amount of calcium-ions are present in the solution of NaCl. The amount of $CaCl_2$ needed for this purpose may be between 0·015 and 0·020 per cent. On increasing or diminishing the calcium hæmolysis occurs. It is not necessary in this case to use a buffer, for no acids are formed here as in the perfusion of the kidneys.

Experiments similar to those on the kidney were performed on the automatic movements of the rectum (Brinkman and Van Creveld[32]) and stomach,[33] and even on the secretion of the gastric mucous membrane when the vagus is stimulated (Brinkman and Van Dam[34]). The concentration of the Ca-ions must always be confined within very narrow limits, and this is effected by using the modified Ringer's solution as well as in the normal serum.

The fact that in normal serum the concentration of the Ca-ions is kept fairly constant may be the reason why the therapeutic application of Ca-salts is so often of no value. When acidosis exists, however, the concentration of Ca-ions is altered.

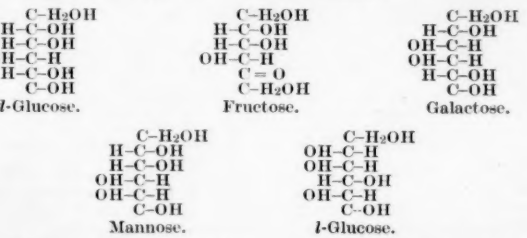
## SOME REMARKS.

(*a*) *Tolerance.*—There are four other points in connexion with the permeability of the glomerular epithelium to glucose. In the first place, when the amount of glucose added to a suitable Ringer's solution is greater than that which is normally present in the blood plasma of the frog all the glucose is not held back. The amount of glucose let through increases with the amount added. It is even possible to add so much glucose that it all passes through the glomerular membrane. Is this phenomenon to be ascribed to damage done to the glomerular membrane by the increased amount of glucose? In any case the glomerular membrane becomes more and more permeable; in other words, the tolerance of the glomerular membrane decreases and even becomes nil. I shall not discuss this question here, only I wish to remark that the same phenomenon is observed with red corpuscles, which are also made more permeable by and to glucose.

(*b*) *Hyperglycoplasmia.*—The second point is connected in a natural way with the first. We all know that one is accustomed to speak about hyperglycæmia when the total amount of blood-sugar is greater than normal; but when investigating the relation between hyperglycæmia and glycosuria the important point is not the total amount of sugar in the blood as a whole but the amount of sugar present in the plasma; one must know the degree of hyperglycoplasmia. Of late years a number of investigators have studied the partition of sugar between corpuscles and plasma; most of them agree that there may be a considerable amount of sugar in the corpuscles, but only in the case of man and the dog. The experiments of van Creveld and Brinkman recently conducted in my laboratory have established in a direct manner that in circulating blood glucose is exclusively present in the plasma, and that the transit of sugar from plasma to corpuscles takes place when the blood is defibrinated;[35] the migration occurs as soon as coagulation commences, and for this reason is to be observed even in hirudinised blood.[36] If, however, the blood is collected in a tube coated with paraffin and at once centrifuged it is found that all the sugar is present in the plasma. This is of great importance for the quantitative determination of hyperglycoplasmia, which is the only matter of real importance in the clinical determination of blood-sugar. From a theoretical point of view it is interesting to add that the change which takes place even in the beginning of coagulation of the plasma surrounding the superficial layer of red corpuscles is sufficient to alter the permeability of the red corpuscles to sugar.

(*c*) *Phloridzin.*—A third direction in which our work on the permeability of the glomerular membrane to glucose was extended was in connexion with the influence of traces of phloridzin on the passage of glucose into the urine. Brinkman[37] found that when only 0·0004 per cent. of phloridzin is added to the perfusion liquid no trace of sugar is held back by the glomerular membrane; the renal portal vein was ligatured, so that the renal tubules could not have exerted any influence. Thus we may conclude that the glomerular membrane has been rendered wholly permeable to glucose through the phloridzin added. This permeability is perfectly reversible, so that if a Ringer's solution free from phloridzin and sugar is passed through, and then a Ringer's solution containing the physiological quantity of sugar, all the sugar is once more retained. We have therefore before us an additional example of the alteration of the permeability of the glomerular membrane to glucose, and in this case it is caused not by an excess of glucose itself, but by the foreign substance phloridzin.

(*d*) *The Reason why the Glomerular Epithelium is Normally Impermeable to Glucose; Size of the Molecule of Glucose; its Configuration; Isomeric and Stereo-isomeric Sugars.*—The fourth remark has reference to the question why the physiological amount of glucose is normally held back by the glomerular membrane. It is, indeed, remarkable that glucose is retained by the glomerular membrane, whereas other crystalline bodies, like NaCl, sulphates, and phosphates, pass through. We might imagine that the molecule of the monosaccharide glucose ($C_6H_{12}O_6$) is so large that its passage through the glomerular membrane is hindered. We thought that if this notion were correct disaccharides, like sucrose (saccharose), maltose, and lactose, which have a still larger molecule ($C_{12}H_{22}O_{11}$), would certainly be retained as well. Experiments proved, however, that the glomerular epithelium is highly permeable to these three disaccharides. It is even perfectly permeable to raffinose, which has a still larger molecule ($C_{18}H_{32}O_{16}$). Thus the size of the molecule alone cannot be the determining factor.

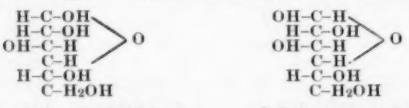



If the retention of glucose could not be ascribed to the size of its molecule there was the probability that a characteristic structure or configuration of the glucose molecule had something to do with it. For this reason some sugars which were either isomeric or stereo-isomeric with glucose were experimented with. For the sake of convenience I give above the formulæ of a few of these sugars.

And it was found that the fructose passed through completely, likewise the mannose, while only part of the galactose was retained. You will notice how slight is the difference between the configurations of these five sugars, especially between d-glucose and its stereo-isomers galactose and mannose. Glucose, therefore, occupies a very peculiar place amongst the isomeric monosaccharides with regard to the glomerular membrane—that is to say, the glomerular epithelium distinguishes glucose from other sugars in a way which suggests the relation of sugars to ferments, like a lock and key. If we apply this to our case we would say that the key (glucose) does not fit the lock (glomerular membrane), and that the other sugars experimented with do fit and pass through. The power of the glomerular membrane to distinguish d-glucose from other sugars goes so far—and this is not without importance from a clinical point of view—that when d-glucose (dextrose) and lævulose are dissolved in the perfusion liquid the dextrose is still retained by the glomerular membrane, but the lævulose passes through. From this it is evident that the power of retention for dextrose is not quantitatively altered. The two sugars are separated from each other as by a filter. What is true for a mixture of dextrose and lævulose also applies to a mixture of glucose and lactose. The lactose passes completely into the urine and the glucose is retained just as when there is no lactose present.

These investigations form a new illustration for the law of stereo-isomerism, but here it is not of a chemical but of a physiological nature as they occur in the domain of permeability. We may repeat, therefore, that it is the configuration of the glucose molecule that imparts to this substance the peculiarity that causes it to be retained by the glomerular epithelium.

In order to know to what group of atoms the retention of glucose was due, we have examined other stereo-isomeric sugars, amongst which were pentoses, such as xylose, arabinose, &c., and some hexoses like galactose. Of these some passed through the glomerular membrane, others could only partially do so. Of those showing partial retention, we have examined especially d-galactose and l-xylose; the former has special importance as it is a constituent of the central nervous system. The partial retention, which was always of about 50 per cent. of the d-galactose and 25 per cent. of l-xylose, is very remarkable, because it appears to disagree with the idea of permeability. A mean between the two extremes of permeability and impermeability can hardly be conceived when we have to do with only a single substance. The reason for it lies in the fact that there are two modifications of d-galactose when dissolved in water—namely, the $\alpha$ and the $\beta$ variety, which only differ in the attachment of the H and OH groups to the asymmetrical carbon atom, as shown by the graphic formula given below. The $\alpha$ variety is retained and the $\beta$ variety allowed to pass through. The same is the case with l-xylose.

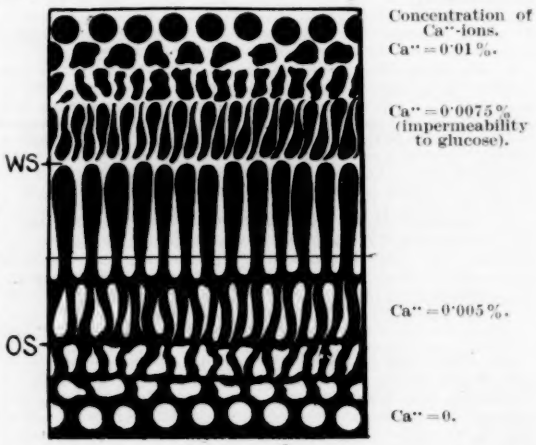



$\alpha$-Galactose held back. $\beta$-Galactose not held back.

To summarise, we may say that the cells, with hardly any exceptions, are permeable to ions of electrolytes and often to organic substances; further, that the physiological, or more generally the vital condition of the cell, or better the composition of the surrounding fluid, exerts a great influence on the permeability.

## VI. MECHANISM OF PERMEABILITY.

There are two theories which can be used to explain permeability; the one is based on the polarised condition of the surface of the cell, and this may be called the electrical theory; the other is the sieve theory. The first is embodied to a certain extent in Girard's scheme, which we have previously mentioned in connexion with the influence of acidity or alkalinity on the movement of ions. The second (sieve theory) is embodied in the views of Clowes.[38] It would take me too far to consider both these in detail, but I would like to make some remarks on Clowes's theory. This originated in an observation by Bancroft (1913),[39] that a mixture of oil and water can be emulsified permanently in two ways: the one emulsion consists of oildrops suspended in a continuous watery phase as in cream; the other consists of drops of water suspended in a continuous phase of oil as in butter. Clowes was able to convert an emulsion of the first kind into one of the second kind by simply shaking an emulsion of oil in sodium soap with a solution of calcium chloride. The reverse took place when shaking with sodium hydroxide. If this is applied to the protoplasm of cells one will obtain two different states of permeability on the addition of Na or of Ca; Ca causes an oily canal system and Na a watery canal system. From this it follows that Ca will create an impermeability to watery substances. In other words, as regards their effects on permeability Na and Ca are antagonistic to each other. The following somewhat modified scheme of Clowes illustrates the experiment very well.




Transformation of emulsion of water in oil to emulsion of oil in water by means of a slight increase of the concentration of Ca⁺⁺-ions.
Water = white. Oil = black. WS = watery canal system. OS = oily canal system.

In the diagram it is seen that the state is changed by adding more Ca-ions (part of the figure above the line), so that ultimately watery solutions might pass. But this is only the case with molecules of certain shapes. These shapes change by adding more Ca-ions, because the boundaries vary with the surface tension. If this is applied to our experiments it is clear why the glomerular membrane becomes impermeable to glucose with an efficient concentration of Ca-ions in the perfusion liquid. It may be stated here that something very similar is obtained in the hæmolysis of red corpuscles. Dr. Brinkman and Miss Van Dam have also observed a decided influence of the concentration of calcium-ions on gastric movements and gastric secretion when the vagus nerve is stimulated. We are not astonished at this when we come to think that, on stimulating a nerve, one has probably to do with the influence of the calcium-ions on the neuro-muscular junction, which is formed at the place where the nerve and the muscle meet.

Why the impermeability in the presence of a definite amount of Ca-ions in the fluid should be replaced by permeability again when there is a superabundance of Ca in the liquid we cannot now discuss. An analogue of such a contrast is seen in the recent

experiments of Neuschlosz,[40] who found that an emulsion of lecithin in water possesses a surface tension dependent on the amount of Ca present. Too much or too little Ca had the same effect. In the therapeutic application of lime salts one also often notices opposite effects according to the amount used.

To return for a moment to what Prof. Bayliss has called the "Clowes's effect," it would seem that the view of the American author is strongly supported by our experiments on the stereo-isomeric sugars. We have seen that pores are left between the oil-drops, and it is obvious that these pores, because they are subjected to the surface tension at the boundary, assume varying shapes. Now pores of a definite shape could allow sugars of a definite configuration—e.g., lævulose—to pass through, while holding back sugars—e.g., glucose—of another configuration. One might be inclined to explain this phenomenon by the aid of differences in viscosity or surface tension. But we have found with Miss S. C. Hamburger that these physical constants are the same for lævulose and for glucose. How can one explain this separation of glucose from lævulose, therefore, other than by supposing that the shape of the ultra-microscopic pores in the sieve plays a decisive part? Our experiments thus lend support to Clowes's theory, and vice versa the mechanism of specific permeability has become clearer.

Finally, it may be said that the conditions shown in our sketch by the portion below the line do not, as a rule, occur in physiological circumstances. In fact we know that, as a rule, all the cells of the body are permeable to water. But there are exceptions. When blood is diluted with a great deal of water most of the red corpuscles in absorbing water loose their colouring matter and the mixture has become transparent. But after centrifugalising I often saw a deposit which examined by the microscope proved to consist of red corpuscles. These cells must have been impermeable to water. Red corpuscles treated with cobra venom are also impermeable to water, and the same is true of the eggs of sea-urchins.[41] When put in distilled water the latter does not enter the eggs, as Ralph Lillie has pointed out, but on adding some Ca-ions their impermeability to water is lost.

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(*Continued at foot of next column.*)

## CRANIOTABES OF THE FŒTUS AND INFANT.

BY EDMUND HUGHES, M.R.C.S., L.R.C.P. LOND

IN a previous paper [1] I recorded some results of a clinical inquiry into this subject. The account then given was composed under the combined disadvantages of military service and paper shortage; and this was unfortunate, because the contentious nature of certain of the findings called for their rather full presentment. I shall therefore make no apology for re-stating these findings in somewhat more adequate form.

Broadly, the position then reached was that the recognised "craniotabes" arising during the first few months of infancy is in many, and probably in most, cases only a fresh manifestation of a state of craniatrophy already existing in later fœtal life, This fœtal craniatrophy, having no physical differences from the later form, and occurring predominantly in the same individuals, was therefore held to deserve the same title. Verification of this finding would entail a re-scrutiny of the common belief that craniotabes is a sign of rickets. A simpler solution of the difficulty would be to infer the causality of syphilis. But the only definite contribution to the problem of causality I was able to make consisted of some fresh evidence tending to rule out syphilis as an acting or proximate cause. The evidence given was, I think, sufficient for that purpose; and it must be remembered that observation alone, though powerless to decide what is causal, can often determine what is not.

I will now go over the previous findings, incorporating such fresh material as has since been obtained. The total case-material is 154.

### *Immaturity of the Skull.*

In connexion with yielding areas in the skull at birth, the problem was early raised in course of this inquiry as to what characters of this kind in the newborn skull can be legitimately ascribed to immaturity. To determine this point, a parallel study was made on some hundreds of living neo-natal crania at various stages of development, and of stillborn and non-viable crania, in situ and detached.* Seeing that in all my cases of fœtal craniotabes the parietal bones were attacked, and that all were born at or near term, interest here centres on the condition of the parietal at and near the end of the fœtal period. The result of study makes it clear that the condition I call fœtal craniotabes and the condition of the parietal due to immaturity are entirely distinct. In the first there is discontinuity of the bone-forming spicules—a true atrophy in some part of their course—

* For the great majority (about 130) of these latter my thanks are due to Prof. J. M. Beattie, who kindly placed at my disposal the stillborn material brought to the Liverpool City Laboratory. This material has also furnished several morbid specimens.

(*Continued from opposite column.*)


Brit. Med. Jour., March 8th, 1919; Proc., vol. xxii., No. 4. pp. 351 and 360, 1919; Hamburger and Alons: Biochem, Zeitschr., xciv., p. 129, 1919; Brinkman: Quarterly Jour. of Exp. Physiol., xii., p. 2, 1919.
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Full particulars about permeability until 1901 in Hamburger: Osmotischer Druck u. Ionenlehre, 1901–04 (Bergmann, Wiesbaden).

together, sometimes, with attempts at repair; in the second, merely an evenly progressive ossifying process in an incomplete stage. Moreover—and this was my main object—mistakes can seldom arise in palpating these bones. The normal parietal at the period in question is rigid, and the only spot where localised yielding due to immaturity is liable to occur is a small symmetrical area about the parietal foramina. These foramina, or the "sagittal foramen" replacing them, lie about 1 to 1¼ inches from the posterior fontanelle. The sense of weakness at this point is due to irregular spacing of the spiculæ near the margin. Except for this, which is easily excluded, the parietal at about term presents no feature due to absolute immaturity which could simulate craniotabes. Yielding of large portions of the periphery like that normal at the seventh month, and due to relative immaturity, is rare enough to be a curiosity, and in any case could not well be mistaken for anything else. In examining many of these bones, a degree of weakness sufficient to cause doubt is occasionally met with along the anterior half of the inner margin. This I at first thought to mean immaturity also, but the X ray reveals an early stage of diffuse atrophy. Such cases, in fact, occupy an intermediate position towards clinically obvious craniotabes, but need not be taken stock of in compiling morbid series.

There is thus no practical source of fallacy in diagnosing craniotabes in the newborn by clinical means.

### *Craniotabes in the Fœtus.*

I shall throughout use the term craniotabes to denote a craniatrophy which has reached a clinically recognisable degree, and which is distinguished by gentle palpation of the bone in situ. The term "infantile craniotabes" will be used to denote a craniotabes which first appears at some time after birth.

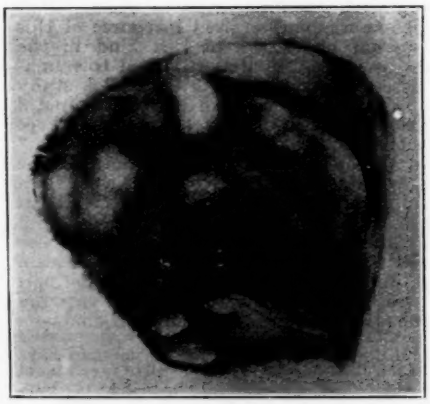
The prevailing opinion, as reflected in text-books, &c., is that craniotabes is a condition developing in infancy, and it is so described. Some have remarked on the occurrence of bony defects at birth, and ascribed them to bone-immaturity. The existence also of a condition at birth deemed to be craniotabes has been recognised by some authors, but, so far as I am aware, as a rarity. Having found this latter condition congenitally with some frequency, and excluded immaturity, my wish was to ascertain whether its analogy with the infantile form was anything more than a superficial resemblance. Evidence was then gradually obtained which collectively affords a sufficient proof of the identity of the fœtal with the infantile form, and this will now be considered seriatim.

### *Physical Characters.*

The atrophy occurs as depressions found on the inner aspect of the bone. The atrophic areas show both lacunar and diffuse formations, both being frequently present in the same bone. The lacunar areas occur as membranous spots isolated in the bone, or it may be abutting on its margins here and there. Their edges show a thinning down of the bone to the membranous or semi-membranous centre, which centre varies in my specimens from about 0·5 to 2·5 cm. in greatest width. The diffused areas may be membranous in part or wholly, or merely so far atrophied as to yield with ease. Where the bone is reduced to a thin shell, but not entirely lost, and is palpated in situ through its integuments, it is apt to feel "leathery," though still resilient; areas of total atrophy feel flaccid or "parchmenty," according to their state of tension. Any part of the parietal may be involved, but in all cases I have recorded the site of election has been the inner half, and especially its anterior two-thirds. In 76 instances (66 in vivo) the parietal was affected in all, the right alone in 27, the left alone in 13, both bones in 36. In 2 the upper portion of the frontal was also involved. The squamo-temporal and squamo-occipital were not found implicated in any.

Palpation is sufficient to settle the fact of atrophy, and to determine its main features; but in detail it is inaccurate, and this must apply also to palpation of infantile craniotabes. Parts bridged by bone are apt to yield like one, and adjacent bone, especially on the peripheral side, through loss of its normal support, sometimes seems to belong to the atrophied area. For this reason my previous illustrations, based on results of palpation, represent very imperfectly the true state of things. The radiograph now shown is sufficiently illustrative, though the definition might perhaps be improved. (The low density of these bones entails the use of a very "soft" tube.) For comparison, a normal parietal at term is included, and one showing infantile craniotabes taken as figured from Carpenter's book on syphilis in children, and given by the author to illustrate that form.

FIG. 1.

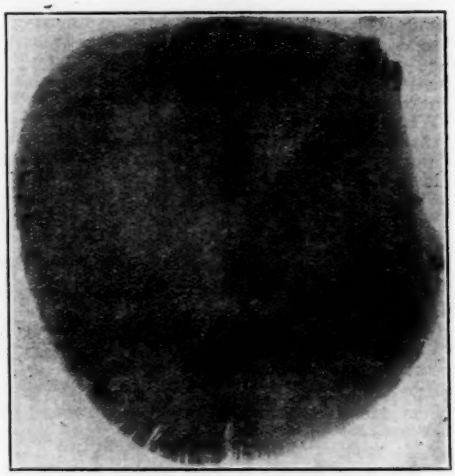


Parietal bone of subject at term with craniotabes. Note predominance of atrophy in anterior two-thirds of internal segment.

FIG. 2.

Repair proceeding in a large circular area at birth.

FIG. 3.



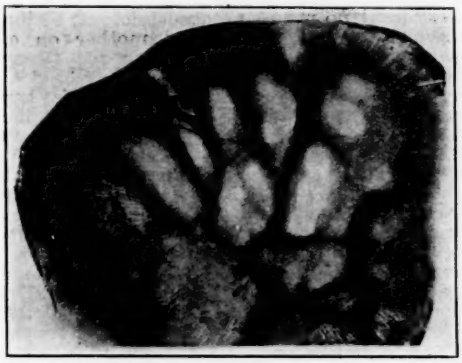
A normal parietal at term (vertex presentation).

### *Macroscopic Details.*

In parietals at birth showing normal ossification the vascularity of the bone may appear uniformly distributed, or show a degree of irregularity in this respect. In those showing craniotabes, however, there is sometimes, not always, definite hyperæmia

with an irregular distribution. This is best seen in more advanced examples, and after hardening, when their dark colour is in sharp contrast with the appearance of normal specimens. The hyperæmia is seen to be more pronounced in a broad zone round the atrophied parts. The pericranium is not noticeably thickened. This structure is often ill-developed at birth, and may not strip very easily off a normal bone. It usually strips off an atrophied site, though the presence of old blood may cause partial adhesion and pigmentation. The same description applies to the dura, which, moreover, is thinned over membranous sites. One naturally thinks of intra-partum

FIG. 4.



Part of parietal showing infantile craniotabes. (From Carpenter.)

damage in these cases, but in my confinement series only one stillbirth occurred, probably from unrelated causes; the others seemed none the worse, then or afterwards. Though numbers have been re-observed at later ages, no evidence of cortical injury has been met with. The following shows, however, the intra-partum possibilities in a rather extreme case—a stillborn female infant in my laboratory series:—

There was much inner segment atrophy of both parietals, chiefly diffuse and partial. The left showed a fracture 1¾ inches in length, parallel with the sagittal edge and involving the thinned bone near its junction with normal bone. The pericranium here was torn through, and a layer of recent blood extended beneath it as far as the eminence. The underlying dura, otherwise uninjured, was separated from the bone by blood and serum (commencing internal cephalhæmatoma). Further forward, both dura and pericranium were partially adherent to the atrophic bone up to the fontanelle, the adhesion being due to a thin deposit of old (ante-partum) blood. The subjacent cortex was apparently undamaged.

One would expect sub-pericranial hæmatoma after the birth of severely tabetic skulls, especially where the margins were diffusely atrophied. Of 11 examined post mortem, three showed atrophies of this type, and in all three there was commencing hæmatoma. Till recently, the significance of this point had unfortunately escaped me, so that the absence of record of it among those that survived may mean a fact or an omission. As this accident, however, probably occurs in under 1 per cent. of all births, it is unlikely to complicate these cases with any frequency, at any rate to a clinically obvious degree. But when present, especially on both bones, the possibility of underlying craniotabes may be borne in mind. The histology of these bones will be given in a later note.

*Mechanical Causation.*

This is the only certain element in the causal nexus of craniotabes in general. Yet that it has sometimes been disregarded is shown in the statement of Carpenter[2] that craniotabes (infantile) cannot be a sign of rickets because it is getting better while rickets is developing; and by an argument quoted from Wieland[3] that the imperfectly ossified areas occurring in the newborn do not mean craniotabes because they occupy a different part of the bone. This latter is also an error of fact, as they may be found in the same part, but the observed differences of position at the two periods is exactly what would be expected if the two conditions were identical. At both periods they occupy the most dependent regions of the skull, the regions of maximum strain. Again, it is a mark of a true cause (in action) that when removed its effect (if impermanent) always begins to cease from that time forward. Events were followed in some fifty or more of my cases, and in all progressive repair was observed to take place where (as is usually the case) the fœtal area was situated outside the new regions of pressure after birth.

The physical characters tell the same tale. In the normal majority of skulls at term, the indentations accommodating the cortex are as yet ill-marked and scanty. Craniotabes (in general) implies a morbid exaggeration of these in dependent parts. For the fœtus, and in head positions, one must infer a double force of compression-tension for both inner and outer strata. The design of the parietal bone bears out this inference, at any rate for the outer stratum. There is, of course, no diploëic space at this age. The inner layer is thin and compact; the outer layer, in contact with the inner, and about two to three times its thickness, I find to show partial interlacement of the radiate fibres, together with a general tendency to slant from the inner towards the outer surface from centre towards periphery. This latter arrangement, so far as it exists, would tend to equalise strains from external pressure, and to transfer them towards the stronger interior bone. Owing to the general structure, external compression strain would tend to be transferred to the apex of a wedge of strain whose base is on or faces the margin, and this, so far as there is need to assume it, would help to explain the frequent occurrence of atrophic holes in the interior. Internal compression by the semi-diffluent brain-mass of the fœtus should be moderately uniform, but with a gravitational stress concentrated on the inner segment. The greater tendency to diffused and other atrophy in this segment is, no doubt, thus accounted for. One can only postulate the main features of so irregular a mechanical system as this, whose complexity is increased by the various fœtal movements, and by such developmental variations as may occur in the bones themselves. There is further to be included the inconstant lie of the head in relation with the uterine wall, the obliquity of the uterine axis, &c. The greater implication of the right parietal is of interest in connexion with the lower lie of that bone so far as gravitation is concerned, in first positions; while the general anterior position of these atrophies together with other points should help in determining the normal stresses on the fœtal head prior to labour. I have only found craniotabes in births by the vertex. Its occurrence in other than head presentations would indicate that the fœtus had recently changed its position.

*Clinical Course.*

Rigidity of the fœtal area removed from stress is generally accomplished, clinically speaking, by the end of five weeks, but repair may be much more gradual and prolonged to three months. The finding of areas far forward during infancy, if this is not far advanced, would mean their origin in the fœtus. During the first four months of infancy fresh areas in the posterior segment are very liable to develop, and the case then becomes one of infantile craniotabes, which subsequently runs its usual course. This sequence occurred in 33 out of the 38 which I was able to follow up. Of 117 born without recognisable craniotabes, and followed to some part of the fourth month, 10 afterwards showed it. Allowing for modification by larger figures, the discrepancy found (about 86 as against 8 per cent.) is still great enough to justify my inference that the bulk of infantile cases are recruited from those showing

recognisable craniatrophies at birth. This is well explained for many by supposing the skull at birth already prepared for further craniotabes by a degree of atrophy in the posterior segment as yet unrecognisable to palpation, and not to be detected by any but radiographic means. It is, moreover, in this quadrant, part of the segment most prone to atrophy in fœtal life, that I find infantile craniotabes to more commonly begin. It may also be observed to start from the thinned margins of small atrophic areas found in the posterior segment at birth. Such considerations may explain why most infants escape post-natal craniotabes, though subject to like conditions. But it may be also plausibly argued that the organic causes of decalcification present in the fœtal state are carried on into infancy.

Enough has now been said to indicate that the inception of craniotabes as a pathological event must be relegated to fœtal life, if not always, then very often. In connexion with the whole argument the absolute frequency of pre- and post-natal forms needs to be worked out. My own figures (industrial population of Liverpool) give so far for all grades of the fœtal form 21·6 per cent. (60 out of 277 unselected vertex births). A series of still-births furnished ten examples in about 63 (in a few of these the presentation was uncertain). For the infantile form a recent probable estimate by Wieland[4] gives about 20 per cent. of all infants, presumably studied in a city district. These figures, so far as they go, tend rather to support the thesis just advanced.

*Infantile Craniotabes.*

My material here is 109 cases, but any deficiency in point of numbers has been, as I venture to think, more than compensated for by the method of continuous and intensive study given to individuals. Results as to localisation agree closely with those of Carpenter, who found the occipital seldom affected in comparison with the parietal. In all my cases where the occipital was affected, there was at some time more pronounced or extensive atrophy in the parietal, and there was evidence or proof that the former was involved secondarily in point of time. The occipital, however, may be the last to heal. The statement of Stoeltzner[5] that craniotabes is only found after the first three months is contradicted by my results, numbers developing during the second month. The earliest began in the fourth week, the latest at the end of the fourth month. Most, however, reach a maximum by this latter age, and thereafter begin to regenerate. The mechanical conditions furnish the key to the period of incidence. Relief of pressure is brought about earlier in some than others, but in most is sufficiently accomplished by or before the end of the fifth month. Accordingly we find craniotabes disappearing after this time, given relief of pressure, whatever the child's state of health may be. Difficulty has been felt by some[6] in assigning the same pathology to diffused and lacunar formations. This I do not share, since the same case may represent the lacunar form when it begins, the diffuse form at its full development, and the lacunar form again as it heals. In areas widely atrophied, remnants of partially calcified tissue are often left, and regeneration occurs from these as well as by irregular invasions of bone from the centre of ossification. The result is that a broadening trabecular arrangement of new bone is apt to be formed, enclosing ever-dwindling atrophied spaces. If the case is first seen in this last phase, it may appear sui generis, especially since manifest rickets may be present at these ages. The variations in contour of the back of the skull may be held responsible for some of the varieties in form and position met with.

*Organic Causation.*

The mechanical causation of this curious condition is clearly only a part of a causal nexus. Though the great majority of individuals are subject to closely similar mechanical conditions, only a minority—say one-fifth—develops craniatrophy to the clinically recognisable degree. In this minority, therefore, decalcification must be promoted by some morbid agency. Here I shall deal with syphilis and rickets (or rather, the as yet unknown causes of rickets) † as possible morbid agencies, in the light of such data as the present inquiry can contribute. I find it possible for a child to have fœtal followed by infantile craniotabes, and to pass through infancy and earlier childhood without showing any sign of either disease; but this observation has little real weight. Rickets may be arrested before it is clinically demonstrable, and syphilis may remain clinically latent. Most craniotabetics show either one or both; and by different schools of opinion the causality of both, separately or combined, has been asserted, though as a rule with little serious attempt at proof. The problem is by no means an academic one, seeing the therapeutic needs of child and mother on either assumption, and the importance to the theory of rickets of a decision on the matter.

Regarding syphilis first, its relation is beyond dispute, for it is consistently present in series, including my own, to as much as 50 per cent. or more. These findings, moreover, are based on clinical evidence, and a positive residuum over and above this must be allowed. From historical analogies, the argument, therefore, seems a fairly strong one for the necessary antecedence of syphilis; but the connexion needs examining further. Carpenter, who devoted long attention to this subject, estimated that about 50 per cent. of congenital syphilitics show craniotabes. If the above estimate of about 20 per cent. of all infants is also near the mark, we should then be required to assume that some 40 per cent. of infants, in our city populations, are born with syphilis—an estimate very widely in excess of any yet made on other grounds, clinical or pathological.

The same observer prepared charts showing the coincidence of craniotabes with the manifest syphilis of the earlier months.[7] Granting the coincidence en masse, we have yet a very good mechanical reason for the predominance of craniotabes at these ages, quite apart from the activity of an accompanying syphilis; moreover, the coincidence largely disappears on going into detail. The maximum of each is generally reached at different times, and if individuals are studied in continuity, their craniotabes is found to have an independent career, determined by the pressure conditions. Moreover, craniotabes shows indifference to an otherwise successful course of mercury. This rule has been uniform in my experience when cases are chosen at the right time, say those starting in the second month, which nearly always will spread in natural course. It is useless to select cases at the period of natural healing, since this goes on at differing rates. It is also noteworthy that extensive cases sometimes run their whole course without any sign of syphilis. In 10 still-born instances examined, *S. pallida* was not found in liver, spleen, and lung, and the Wassermann reaction, taken in 9, was negative.‡

While such considerations, together with other points not now enumerated, all go to discredit the causal agency of syphilis, its more remote causality could not well be excluded so long as we are largely ignorant of its power of injuring the fœto-infantile mechanism of calcification, and while it seems possible that some cases of low virulence and latency escape our present methods. I find it, however, more rational to regard its action in that kind as nonspecific, and its association with craniotabes as having the same meaning as its association with rickets, which in the human subject is deceptively close, the action in both conditions being to promote resorption of bone. In other words, were it not for the presence of syphilis, many of these craniatrophies would not have time to reach a degree where they can be clinically recognised.

† All that is up to now determined is the agent, or one of the agents, preventing rickets. The causes producing it come into play after the preventing agents are removed. These causes are unknown.

‡ I have Prof. Beattie's permission to mention these results, which were obtained in his laboratory.

Regarding rickets, my observations suggest that it is clinically associated with much the same frequency as syphilis. Though the severity of craniotabes and a subsequent rickets often varies directly, this ratio is quite inconstant. The feeding in 105 cases when first found with infantile craniotabes (extreme ages 1 and 9 months) was: exclusive

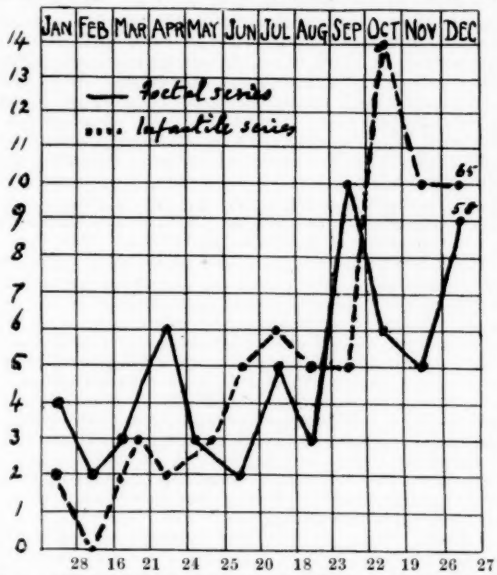



FIG. 5.—Chart showing the months of birth of 123 craniotabetics.

breast-feeding, 62; mixed feeding, 14; exclusive hand-feeding, 29. In the breast-fed the atrophies were not less extensive, but usually partial in degree. That so many were breast-fed is against expectation, but it may be argued that, ceteris paribus, if the maternal blood cannot prevent craniotabes the maternal milk will not be able to prevent it afterwards.

The point on which observation can best help theory appears to me that of seasonal incidence. This is now being worked out. The results so far are shown herewith, though their inadequacy as yet is patent. The month of birth is stated for 123 in which it is known. The infantile series includes cases only observed with that form. In the fœtal cases (58) an error involved in such estimates can be checked by knowing the number of births per month among which they occurred (see foot of chart).

It seems, therefore, that a seasonal curve may exist. Thus 51 per cent. of the fœtal series, and 60 per cent. of the infantile, were born in the last four months of the year. Supposing the bulk of fœtal cases to show infantile recurrence, it would follow that infantile craniotabes will be chiefly met with, at any rate in its worst degrees, in the first few months of each year.

If a marked winter aggravation is confirmed by larger figures, it will serve to that extent to ally craniotabes with rachitic phenomena in general. But the chief difficulty remains. We have seen that the early disappearance of craniotabes is no obstacle to its acceptance as a true sign of rickets; but its early appearance constitutes a difficulty which has already existed for the earlier infantile examples, and is only somewhat increased by bringing in the last few weeks of pre-natal life. A partial solution may be attempted, however, by recognising the influence of stress on the individual bones in determining the order of rachitic bone changes in general. Such knowledge as we have indicates that the stresses on the fœtal long bones are generally less intense than those obtaining in the outer world. But the stress on the dependent cranium must be considerable, both by its position in the relatively rigid lower uterine segment, and by the interior brain-mass for some 16 hours out of each 24, the total stress being probably greater then than after birth. Add to these considerations the partial immunity of the fœtus against adverse maternal influences, and the possibility, by analogy, that any such effects might be shown in a modified form at these early periods, and the difficulty becomes, perhaps, less formidable.

With this particular problem, however, observation can do little, and one awaits the results of the experimentalist, especially on such subjects as the effects on the fœtus of ill-balanced maternal diets involving deprivation of vitamin A, and the causes of osteomalacia.

*References.*—1. THE LANCET, June 13th, 1918. 2. Brit. Jour. Child. Dis., February, 1908. 3. Findlay, L., Med. Research Com., Special Report, No. 20, 19. 4. Ibid. 5. Pfaundler, M., and Schlossmann, A., Dis. of Ch., 1912, vol. ii., art. Rachitis. 6. Still, G. F., Disorders of Childh., second edition, 73–4; Cautley, E., Dis. of Ch., Garrod, Batten, and Thursfield, 1913, 112. 7. Reports Soc. Study of Dis. in Child., vol. iii., 215, 299, &c.

## ANTIMONY AND EMETINE IN BILHARZIA DISEASE.

BY F. G. CAWSTON, M.D. CAMB.

IN 1917 Dr. J. B. Christopherson established tartar emetic as the routine treatment for bilharzia disease in Egypt, and no equally effective but less toxic preparation of antimony is at present available. Undesirable results of unskilful administration of the drug are still being experienced in various parts of South Africa, the solution causing necrosis through being injected under the skin instead of into the blood stream. Sometimes large doses are given before the usual tolerance for the drug has been acquired, and occasionally the doses given are too small to produce any appreciable effect on the parasites.

During 1920 I recorded[1] my results obtained by treating a number of cases of bilharzia disease by intravenous injections of a freshly prepared solution of tartar emetic, the injections being given on alternate days shortly after a light breakfast, the dose varying from ¼ gr. to 1½ gr. The doses were gradually increased until the largest dose that the patient could comfortably tolerate was reached. The subsequent history of these and other cases show that, where the injections are given regularly over a period of 28 days, there is little possibility of a return of the symptoms. A dose of more than two grains is unnecessary; larger doses do not appear to effect a cure any more rapidly. It is always risky to discontinue treatment before the 28th day or to give the injections less frequently than three times a week. I have seen recurrences when 15 gr. have been administered over a period of 24 days and others where four days have been missed in the middle of treatment, but none where treatment has been continued without interruption for 28 days, even though no greater total dose has been given.

The powder was dissolved in from 4 to 12 c.cm. of boiling distilled water just before being drawn up out of a wide-mouthed test-tube into an all-glass serum syringe which had already been sterilised and had a suitable needle attached. It has always been my practice to boil both needle and syringe before use, and to paint the skin with rectified spirit before injecting the needle, and I see no reason to alter this procedure. Without discolouring the skin, spirit rapidly produces a clot which helps to arrest bleeding and assists in rendering the seat of injection both aseptic and anæsthetic. Incompletely cured cases of bilharzia disease are especially liable to attacks of renal colic, and when the general health does not rapidly improve after treatment it is generally because all the parasites have not been destroyed. These attacks of colic which sometimes occur during the course of treatment are probably due to an accumulation of incompletely destroyed ova in the kidney substance, which, under ordinary circumstances,

[1] THE LANCET 1920, ii., 392.

would have escaped through the bladder wall without reaching the general circulation.

*Various Preparations of Antimony.*

As a rule the sodium salt of antimony can be given in larger doses than the potassium salt; but I have had patients under treatment with the sodium salt who manifested rather severe toxic effects, such as one sees only with the larger doses of the potassium salt, and I do not find it as effective as tartar emetic. I have treated a number of cases with a preparation of antimony, acetyl paraphenylendiamine antimonyl tartrate, which Messrs. Allen and Hanburys had prepared, and hoped would prove less toxic than tartar emetic. I did not find it appreciably less toxic than an equivalent dose of tartar emetic, though I was able to effect permanent cures by its aid. In several cases I employed Oppenheimer, Son and Co.'s colloidal preparation of antimony, oscol stibium, and a patient of 14 could tolerate up to 7 c.cm. given intravenously without the slightest toxic effect. However, to produce a permanent cure with this preparation alone I found it necessary to press the doses until such toxic effects as diarrhœa and a rise in temperature show themselves. In using this colloidal preparation of antimony in the intramuscular treatment of several leper patients, I also found that the best results were obtained when the patient was well under the influence of the drug, and from what I saw of the lepers on Robben Island, who at my request were being treated with antimony in April of this year, I have no doubt that the non-toxic doses that were being given were responsible for the smallness of the results obtained. By treating a number of bilharzia cases with Crookes's collosol antimonium I have shown that this preparation of antimony also produces a like process of degeneration in the ova that escape in the urine. Much caution must, however, be made in regard to the supposed value of colloidal preparations unless we can be sure that the supplies we receive are stable, as I believe both these products now are.

*Treatment with Manganese and Arsenic.*

I have had good results in the treatment of cloudy and offensive urines with intramuscular injections of colloidal manganese, but neither manganese nor arsenic appears to have any effect on the bilharzia worms in these cases. One patient of 19 received 11¼ gr. cacodylate of soda intramuscularly or subcutaneously in August, 1920, and 76 c.cm. of diemenal in October without any appreciable change in the ova, though the urine itself was much clearer. However, the condition soon cleared up with a few doses of emetine, the largest dose given in this case being 2½ gr. intramuscularly.

*Successful Treatment Indicated by Black Ova.*

It is not at all uncommon to see black ova in the blood-stained urine of patients who have received no treatment, and during an attack of colic ova are often seen in all stages of degeneration. It is the gradual increase in the signs of degeneration and the gradual disappearance of the ova until none but black ones are seen that warrants the assertion that a remedy is proving successful. It has been suggested that the adult worms are destroyed by only a few doses of antimony and that the subsequent doses are required only for the ova; but I have had under me patients who discontinued treatment after two or three weeks with a gradual return of their symptoms, whilst the number of degenerated ova have gradually been replaced by perfectly normal ones, suggesting that some of the adult bilharzia worms that escaped destruction had entirely recovered from the effects of the drug.

*Infusion of Berkheya.*

I heard that a kaffir root was very effective when given as an infusion. It proved to be berkheya (*Stobœa speciosa*), but a fresh infusion in rapidly increasing doses had no effect on two cases. There is the possibility of a local unknown specific plant, but in view of the presence of *Schistosoma bovis* infestation in South Africa it is also possible that the relative immunity of some persons is due to the ingestion of fluke-infested meat.

*Emetine Hydrochloride.*

As emetine hydrochloride has been recommended in the treatment of bilharzia disease, I determined to give it a thorough trial in Natal. I was fortunate in having the clinical condition confirmed in all the cases by the results of microscopic study, and in several of them by the complement-fixation test as well. One of the drawbacks to this method of treatment is the cardiac depression which may develop in some patients during the second or third week if emetine is used without any other drug to counteract this effect. The cardiac depression which is indicated by a small rapid pulse readily responds to treatment with small doses of digitalis, but can generally be avoided if the dose of emetine is skilfully regulated and the following tonic prescribed:—

| | |
|---|---|
| Ferri et amon. cit. .. .. .. .. | gr. v. |
| Liq. ars. .. .. .. .. .. .. .. | ℥. iii. |
| Inf. gent., ad half ounce in water | t.d.s.a.c. |

Even with the larger doses of emetine which are required and can be given on alternate days, I find that local reaction causes only very slight inconvenience to the patient if the emetine is dissolved in 20 mm. of a 1 per cent. solution of carbolic acid, which can be boiled along with the hypodermic syringe and needle. It is best not to use the same site for an intramuscular injection more than once. Should the muscle become sore, a hot sea-water bath on one of the days when no injection is given is very gratifying. Intravenous injections of emetine may cause immediate cardiac depression and are better avoided. I was surprised to find intravenous injections no more effective than intramuscular injections.

I have obtained the best results by giving an intramuscular injection daily for three days and then three times a week for three weeks. I generally commence with an initial dose of ½ gr. for an adult and ¼ gr. for a child. A dose of 1 gr. is a sufficiently large one to work up to in a child of 12. Vomiting may occur if the injection is given shortly after a meal. The maximum regular dose for an adult may be regarded as 2 gr., but larger doses appear to cause toxic effects and to cure more rapidly. The accumulative action of emetine is almost as marked as the acquired tolerance for antimony, and the dose should be lessened or given less frequently towards the close of treatment. Our aim should be to keep the patient well under the influence of ipecacuanha without producing undesirable toxic effects. A slight return of albuminuria after the urine has cleared sometimes indicates toxæmia, and—as with the antimony treatment—suggests that the injections must be given less frequently or the dose lessened. It is generally necessary to continue treatment for about 25 days.

A. H. Harkness has reported[2] that 14 gr. in two weeks and 20 gr. in three weeks proved ineffectual in an adult; but Diamantis, of Cairo,[3] reported that 0·85 to 1·05 g. (from about 13½ to 15½ gr.) was generally sufficient to cure a case if 10 to 12 injections are given at intervals of from three to five days.

*Conclusion.*

My experience in Natal shows that the emetine treatment carried out along the lines I have described is undoubtedly a better way of treating children and young persons than that which involves intravenous injections of antimony. The progress of a case can be determined with certainty only by the microscopic examination of the centrafugalised deposit of urine passed, and it is the last portion which contains most of the ova. By examining the urine in this way I have observed the same degenerative changes taking place in the ova of *Schistosoma hæmatobium*, *S. mansoni*, and *S. bovis* whilst patients were being treated with emetine as those which are commonly associated with the antimony treatment.

Towards the expenses involved in this research a grant was received from the British Medical Association.

Durban.

[2] Brit. Med. Jour., 1920, ii., p. 890. [3] Ibid., 1921, i., p. 70.

# AN OUTBREAK OF BACILLARY DYSENTERY IN A BOYS' SCHOOL.

BY W. E. FITZ-GERALD, M.B., CH.B. EDIN.,
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THIS outbreak of bacillary dysentery was brought to notice by the notification of an acute case which occurred in a boarder at the school. In consequence of this the school was visited, and the following facts were obtained.

*The School.*—A boys' school containing 40 boarders, and having an attendance of about 150 day-boys. It consists of two large houses joined together; one house, where the classrooms are situated, is used almost entirely as a school-house, but has at the top a dormitory for six boys. The other is the headmaster's house, and in addition to the headmaster and his wife, the kitchen staff, &c., accommodates 36 boarders. Six rooms—three on the second storey and two on the third—are set apart as dormitories for the boarders. There is one w.c. on the second storey, with a bathroom adjoining. The towels used by the boys are hung up in the bathroom on numbered pegs.

*Intercommunication between Day-boys and Boarders.*—During the day both day-boys and boarders use a block of offices in the playground; and if a day-boy remains for meals, he attends at the dining-room in the headmaster's house with the boarders.

The outbreak began with a series of cases of mild diarrhœa lasting for a day or two, and only in one case was the boy ill enough to be confined to bed for more than two days. This case was the first to occur, and lasted for seven days, but was of a mild type. All cases amongst the boarders occurred in three dormitories, two on the second storey, on opposite sides of the central landing, and one on the third storey.

*Sequence of Cases.*

(1) *Amongst Boarders.*—The first case occurred on March 1st, the second and third on the 6th, the fourth on the 7th, and the fifth on the 9th. The first acute case giving a typical clinical picture of bacillary dysentery occurred on the 9th, another acute case commencing on the 11th. Two boys were already isolated in two dormitories on the top storey, one suffering from measles and the other a measles contact. There was an indefinite history of both having had slight diarrhœa, so they were included in the investigation.

(2) *Amongst Day-boys.*—On the 14th, a day-boy became ill with symptoms of acute dysentery. Daily lists of absentees were asked for from the headmaster, and in each case of absence the home of the boy concerned was visited in order to exclude the possibility of mild cases being undiscovered; as a result of this one boy was found to be suffering from diarrhœa which lasted for one night. Specimens were asked for from the doctor in attendance, but were not obtained in a form suitable for laboratory work. This boy has not been included in the laboratory report.

The order in which the cases occurred is shown in Table I.

TABLE I.

| March 1st. | 6th. | 7th. | 9th. | 11th. | 14th. |
|---|---|---|---|---|---|
| R. T. | H. C. | E. L. S. | R. F. | E.* | G.* |
| — | C. M. | P. S. | T.* | — | — |
| — | A. C. | — | — | — | — |

* Acute cases with typical clinical symptoms.

*Southport Organisms.*—The strain isolated from the first acute case proved to be of the Flexner type, although it was also agglutinated by type Y serum; and this strain was recovered from the second and third acute cases.

The examination of fæces of the three clinical cases gave the bacteriological findings as shown in Table II. (A). Cases T. and E. showed very definite clinical dysenteric conditions, were seriously ill for a few days, but cleared up satisfactorily, while Case G., who was the last of the three clinical cases to develop the disease, was by far the most serious clinically; and several doses of anti-dysenteric serum were administered during the initial days of the illness. The examination of fæces from seven boys with a history of mild diarrhœa gave the bacteriological findings as shown in Table II. (B).

TABLE II.—*Results of Bacteriological Examination of Fæces from* (A) *Three Clinical Cases.*

| Cases. | MacConkey plates. | | Lactose. | Glucose. | Mannite. | Dulcite. | Saccharose. | Maltose. | Litmus milk. | | Indol. | Motility. | Macroscopic agglutination. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L.F. | N.L.F. | | | | | | | 1st day. | 3rd day. | | | Flexner. | Shiga. | Y. |
| T. | Very few | + + + | — | A | A | — | — | — | Acid | Alk. | — | — | 1/800 | 0 | 1/1600 |
| E. | Very few | + + + | — | A | A | — | — | A | Acid | Alk. | — | — | 1/2000 | 0 | 1/2000 |
| G. | + | Few | — | A | A | — | — | — | Acid | Alk. | — | — | 1/3000 | 0 | 1/2000 |
| (B) *Seven Boys with History of Mild Diarrhœa.* | | | | | | | | | | | | | | | |
| R. F. | + + | Nil | | | | | | | | | | | | | |
| E. L. S. | + + | Very few | — | AG | AG | AG | — | AG | Acid | Acid | + | Slight | 0 | 0 | 0 |
| H. C. | + + | Nil | | | | | | | | | | | | | |
| C. M. | + + + | Very few | — | A | A | — | — | — | Acid | Alk. | + | — | 1/400 | 0 | 1/800 |
| R. T. | + + + | Nil | | | | | | | | | | | | | |
| A. C. | + + + | Few | — | A | A | — | — | — | Acid | Alk. | + | — | 1/3000 | 0 | 1/2000 |
| P. S. | + + + | Few | — | AG | — | — | — | — | Acid | Alk. | + | — | 0 | 0 | 0 |

L.F. = Lactose-fermenting colonies. N.L.F. = Non-lactose-fermenting colonies.
A = Acid. — = Negative. AG = Acid and gas.

These two tables show that in this series of fæcal examinations of 10 cases, non-lactose-fermenting colonies were isolated in 7; of these, 2 proved in subsequent carbohydrate reactions and type-serum agglutinations to be non-dysenteric, leaving 5 strains which conformed in the sugar reactions, and also showed fairly constant agglutination results. In the agglutination tests the macroscopic method was used; and it was found that all the isolated strains of dysentery organisms agglutinated the Flexner type serum to a rather higher titre than the Y-strain serum, and that Shiga serum was consistently negative in all cases. These cases had all at some time recently, and previous to the development of the acute clinical cases, suffered from more or less transient diarrhœa.

TABLE III.

| Cases. | Flexner-Y stock culture. | Southport organism. |
|---|---|---|
| R. F. | 1 in 400 | 1 in 200 |
| E. L. S. | 1 ,, 100 | 1 ,, 80 |
| H. C. | 1 ,, 80 | 1 ,, 80 |
| C. M. | 1 ,, 500 | 1 ,, 400 |
| R. T. | 1 ,, 500 | 1 ,, 500 |
| A. C. | 1 ,, 400 | 1 ,, 300 |
| P. S. | 1 ,, 300 | 1 ,, 200 |

The blood serum from the seven mild cases gave results when agglutinated against *B. dysenteriæ*, Flexner-Y stock culture, and the "Southport organisms" as shown in Table III.

*Source of Infection.*

From the slow spread of the disease from one boy to another, and the fact that there was no generalised outbreak involving a number of the boys at one time, it was considered that the food, drinking supplies, &c., could be excluded, and that the infection was probably coming from a "carrier." The persons most likely to occupy this rôle were two assistant masters and two boys who had spent a great part of their lives in Baghdad.

The history of these cases was as follows: Mr. X., assistant master, an ex-soldier who had been in France for a short time, and Mr. Y., assistant master, in France for two years; A. S., a boy, aged 14, who came to England from Baghdad on July 23rd, 1920, and entered the school in September, 1920. There was no history of enteritis in any of these three. The other boy, A. H. S., aged 14, also came from Baghdad on July 23rd, 1920, and entered the school in September, 1920. He had had an attack of slight diarrhœa two years previously while at Baghdad.

The examination of fæces of the two boys from Baghdad gave the bacteriological findings as shown in Table IV.:—

TABLE IV.

| Cases. | MacConkey plates. | | *Glucose. | Mannite. | Litmus milk. | | Indol. | Motility. | Macroscopic agglutinations. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | L.F. | N.L.F. | | | 1st day | 3rd day | | | Flexner | Shiga | Y |
| A. H. S. | + + | 1 col. | A | A | Acid | Alk. | — | — | 1/1600 | 0 | 1/800 |
| A. S... | + | Nil | — | — | — | — | — | — | — | — | — |

* Lactose, dulcite, saccharose, maltose = Negative results in each case.

The blood serum from suspected carriers and one control gave the results when agglutinated against *B. dysenteriæ* Flexner-Y stock culture, and the Southport organism, as shown in Table V.:—

TABLE V.

| Cases. | Flexner-Y stock culture. | Southport organism. |
|---|---|---|
| A. H. S. .. | 1 in 100 | 1 in 20 |
| A. S. .. .. | 1 ,, 300 | 1 ,, 100 |
| Mr. X. .. .. | Negative. | Negative. |
| Mr. Y. .. .. | ,, | ,, |
| Control .. .. | ,, | ,, |

*Conclusions.*

The details given above show that an infection with *B. dysenteriæ* (Flexner) had occurred in the school and that it was highly probable that the source of infection was a carrier, the evidence being strongly in favour of the boy A. H. S. With regard to this boy, the first two specimens of his fæces to be examined were negative, and the third specimen yielded but one colony of *B. dysenteriæ*. The infection commencing in a mild form assumed increasing virulence, the last case, G., being acutely ill. The seven mild cases, and two boys under suspicion of being carriers, still carried agglutinins to the isolated strains from the acute clinical cases, and also to Stock *B. dysenteriæ*, Flexner and Y strains; it is therefore strongly suggested that although the organisms were not isolated in six instances the infection had been present previously. Two of these, C. M. and A. C., from whose fæces the organisms had been isolated, were among the three highest agglutination reactions obtained.

The bacteriological examinations were made by Dr. Cronin Lowe, pathologist and bacteriologist to the Southport Infirmary.

WELWYN HOSPITAL EXTENSION.—The rebuilding of the Queen Victoria Memorial Cottage Hospital at Welwyn has now been completed at a total cost of £4000. In addition to a new operating theatre and anæsthetic room, three new private wards have been added. These will be available at 4 guineas a week for private patients attended by their own doctors, or in the case of operations by surgeons not necessarily on the staff of the hospital.

## A CASE OF MORAL IMBECILITY.

BY W. NORWOOD EAST, M.D. LOND., M.R.C.S.,
SENIOR MEDICAL OFFICER, H.M. PRISON, BRIXTON.

(*With the Permission of the Prison Commissioners.*)

THE subject of this sketch, a woman at one time under the prolonged observation of the writer, and then approaching middle age, presents in the ascertained incidents of her career features so distinctive of moral imbecility lasting over a period of many years, and doubtless not yet concluded, that some record may be of interest. Many of the facts now related were obtained from an excellent report which cannot here be extensively quoted. In the abbreviated account which follows places and personalities are disguised.

Of the many aliases assumed by the prisoner, the simplest known was that of "Jane," by which name she will be known in this account. Jane was possessed of an intellectual capacity considerably above the average for her station in life; had her ability been associated with normal moral development a happy and honourable career could have resulted. Her parents were humble and honest, and Jane, their eldest child, was born in wedlock during the second year of their marriage. The remaining members of the family are said to be of irreproachable character. There is no record in the family of insanity, epilepsy, nervous disease, intemperance, or criminality, and Jane herself, whom I questioned closely on this point, denied any such history; perhaps on this occasion she may have spoken the truth.

After attending various schools, from the last of which she was dismissed for pilfering, Jane was described as having a good but superficial education, as being a singer and pianist of more than ordinary merit, with attractive conversational powers.

*Early Sexual Delinquencies.*

It is clear that from an early age she possessed a personality which fascinated those men she elected to attract; and this fascination apparently remained with her in later years. It is still conceivable that, suitably gowned, her appearance, manner, and address could command attention, but whilst under observation none of the wiles of the courtesan was noted; her attitude and demeanour at that period suggested frigid chastity. At about her puberty her father died. At the age of 15 Jane became intimate with her mother's lodger, a man considerably her senior, who married her when she was 17, the baby being born shortly after. Quarrels due to her reckless extravagance, involving her husband in debt, soon caused this ill-assorted couple to separate. When re-united husband and wife went from one lodging to another; in five different houses in which they stayed money saved by the landladies for rent was stolen, and mysterious fires broke out. At this period of Jane's life a second child, a cripple, was born; Jane neglected home and children for a gay life, and money saved by her husband to obtain medical treatment for the cripple was spent in dress. Ultimately, as she constantly came home late—often accompanied by men—her husband revolted, and when she admitted immorality they parted and did not come together again.

Before their final rupture Jane made the acquaintance of a lady, Mrs. X, to whom she posed as an heiress having a guardian, Mr. Y. This romance, with variations, has been frequently repeated during her career. On leaving her husband she found employment with a City firm, and occupied rooms in a boarding-house, but her stay was short, for the landlord turned her out on account of the number of men she brought home. From there she went to the seaside, and for the first time in her life, early in her third decade, came into the hands of the police and was convicted for stealing from her lodgings. She was bound over on promising to go into a home, but absconded, demonstrating her lack of a sense of honour.

*Various Impersonations.*

Shortly afterwards she obtained a situation in a hotel as bookkeeper, but being unsuitable was soon discharged; it was then found that she had obtained goods from local tradesmen, representing they were for the hotel proprietor's wife. She was arrested and sentenced to a short term of imprisonment on three separate charges. She then came under the notice of a social worker, and on discharge from prison went to a rescue home. From there she wrote to Mrs. X, representing the home as being the mansion of her guardian, Mr. Y, whom she alleged was pressing her to marry him, and as she only had £50 at hand—her fortune being tied up till she was 23—she felt at his mercy, but was determined to resist his attentions, and asked Mrs. X to take her as a paying guest. This arrangement, however, for some reason did not mature, and the rescue-worker, knowing nothing of this, and believing Jane to have been wrongfully convicted, recommended her to another lady. To this lady's distant rescue-home Jane went, and soon became popular with the inmates on account of her social talents and engaging personality. She told them she was about to be married to a young gentleman, who eventually arrived for the ceremony. He believed Jane to be single, and left abruptly on discovering her to be a married woman with children. It is noteworthy that whilst Jane was in this home money and other articles disappeared in an unexplained manner.

*Arson and Theft.*

Not long afterwards Jane arrived at a seaport, and stayed at a local hotel; a few days later fire broke out in one of the bedrooms and the place was gutted. The next day it was discovered that the cash-box and a sum of money were missing, and the police were informed. Jane, who had left the town, was traced, pleaded guilty to the theft, and received a short sentence of imprisonment. She was not charged with arson, but the events after Jane's arrival at the hotel, compared with previous episodes in her career, leave little doubt that the arson and theft were closely connected.

*Bigamy and Various Other Deceptions.*

On her release from this sentence of imprisonment she went to reside in the leading hotel of an important city, posing as a rich ward in Chancery; at this time she had plenty of money. She applied to the manager of a certain business, informing him she was a ward in Chancery who had run away from her guardian, and asked to be admitted into the business as a learner. She was employed at a small wage, and allowed the freedom of the place to learn what she could of its various branches. From the very commencement she showed a strong desire to introduce herself into the manager's home circle, eventually succeeding in so doing. In this gentleman's house she met a merchant, Mr. Z, who on first hearing of Jane warned the manager of the possibility of her being an adventuress, but within a few days of first meeting her he proposed marriage and was accepted. After about a fortnight's trial at the business she was dismissed, having shown herself incapable of steady application, and being a source of annoyance to the whole establishment. She would carry on prolonged conversations on the telephone with her alleged guardian, whom she stated was living at one of the hotels in the City. Ultimately she and Mr. Z married and lived together. Jane gave out to the neighbours that she was a Frenchwoman recently arrived in this country; to support this pose she spoke in broken English.

Her life with Mr. Z soon became unhappy; she involved him in debt with her reckless extravagance, and at one time he was paying rent simultaneously for three different houses she had taken in his name. One night while Mr. Z was lying awake he heard Jane talking in her sleep; she appeared to be holding a conversation through the telephone with Mr. Z's solicitor, inviting him to the house when Mr. Z would be out. The next day Mr. Z called upon his solicitor for an explanation, and was informed that that gentleman had not seen or heard of Jane for some months; Mr. Z was eventually satisfied that the whole thing was a hoax committed for some ulterior purpose. To those who know Jane there can be little doubt that her love of causing discord would be sufficient motive for this conduct. At one time when living with Mr. Z she sent for a doctor alleging ill-treatment by him. The doctor found no signs of this, but she appears to have threatened suicide. She was attended by a mental nurse and seen by an eminent authority on mental diseases; the latter said she was insane, and a danger to others, being devoid of any sense of right or wrong. She later called in another doctor, alleging serious illness; he found no physical ailment, but considered her hysterical. To this doctor she wove a romance that she was the illegitimate daughter of a lady, an admiral's wife, who had erred during the absence of her husband at sea, and that she was under guardianship. The doctor carefully observed her and considered her to be morally insane and wholly incapable of distinguishing between right and wrong. He also observed that she had already borne children, and on Mr. Z hearing of this they separated.

*More Theft and Arson.*

Soon afterwards Jane wore her hair in public as a long plait reaching below her knees, alleging so much hair was a cause of trouble and annoyance, but one day a lady taking hold of the plait to examine it found it came away in her hands; it had been merely pinned on to Jane's own hair. No reason at the time was assigned for this deception, and Jane, whilst admitting the facts, would give me none. Presently she applied for and obtained a situation in a business where customers' garments were sent. The day after her arrival she was detected cutting out the owners' names, replacing them by her own; she was dismissed, and later stolen clothing was found in her box at her lodgings. She next obtained a situation as companion to a lady under treatment for inebriety. The patient became worse, Jane apparently supplying her with intoxicants, and she soon had to be removed to an institution. Jane then set fire to the bedroom, stole a large quantity of the lady's clothing, saturated some of the other beds with water, lighted a large fire on the kitchen floor, and so terrorised the other servants that they all left the house together. She was arrested, charged with theft, and also of theft connected with the business aforementioned, and sentenced to a short term of imprisonment. She was not charged with arson, and although this is not the last reference that will be made to Jane's efforts at fire raising, I may here relate a somewhat parallel incident, when she was under the writer's care. For the purpose of better observation Jane was located in an association ward with other female prisoners. A dispute arose between them, and Jane seizing some papers set light to them and walked about the ward brandishing them and threatening meanwhile to set the ward on fire. The purpose of this seemed clearly to be to frighten the other patients into giving way to her.

*Further Impersonations.*

After her release from the sentence she applied for a post as probationer nurse at an institution, saying she was a married woman deserted by her husband. The superintendent and matron of the institution interviewed her and decided to help her. A few days later she wrote from a distance that she could not accept the post, as a doctor had seen her and informed her she was pregnant. Her appealing letter induced the kindly matron to travel and see her, secure lodgings for her, and inform her that a post would be kept open for her. Jane then notified her landlady that the superintendent was her guardian, and on the strength of this obtained credit for her lodging. Mr. Z at this time had obtained evidence of Jane's first marriage, his own marriage with her thereby

becoming null and void; the proceedings were reported in the press, and so the facts became known to the superintendent, who washed his hands of her. Jane then returned to the home of the rescue-worker, who had previously befriended her; she was then pregnant. As before, soon after her arrival money mysteriously disappeared, until outside Jane's bedroom window was found a bunch of keys which opened almost every lock in the house. One night the telephone wire to the house was accidentally found to be cut; the house was searched, and behind the curtains in Jane's bedroom was found a pile of inflammable material saturated with petrol ready to be fired, together with a bottle of chloroform. It is not clear for what purpose this drug was obtained, but the chance discovery of the cut wire probably averted a crime and perhaps a tragedy.

On the birth of her child in a maternity home the Roman Catholic priest who ministered to Jane, apparently apprehending the possibility of injury to the infant, urged its baptism at the earliest opportunity. Jane, who was brought up in this faith, ultimately consented; the Roman Catholic sisters received the child, and the baptism took place in their chapel. On their return they discovered Jane had substituted the infant of a Protestant girl for her own. Eventually her own child was baptised. When she recovered from her confinement, the child —admittedly Mr. Z's—was put in the care of a woman, next door to whom Jane took private lodgings. One of her landlady's children was ill about this time, and Jane informed the mother she was going to consult a professor, with whom she was on terms of intimacy, about the child. On her return she reported the professor was coming next day to operate, and much fuss and elaborate preparations resulted; but as the doctor did not arrive the child's father, after waiting some time, prepared to go out. At this moment Jane raised an alarm of fire. The dining-room sofa, well away from the fire, was burning; much damage was done to the room, and the husband did not go out. A day or two later his gold watch and chain, only worn on special occasions, were missing.

*Posing as a Nurse.*

The next episode shows Jane in an even more sinister light. In the same city a gentleman advertised for a nurse to take care of his wife dying of cancer. Jane, calling herself a nurse, was engaged, and money was handed to her to obtain comforts for the patient. No comforts were provided and the money was not seen again. A night or two afterwards Jane was discovered bringing men to the house, and instead of being with the patient during the night was frequently absent. A few days later a maid entering the sick-room found a rubber tube connected to the gas burner lying with its open end on the invalid's pillow. The following day Jane was discovered bending over the patient with a bottle of chloroform in her hand. When asked to explain her behaviour she alleged she was carrying out the doctor's instructions in the matter of the gas and the chloroform, which statement he, of course, at once repudiated. It was also observed that the patient seemed worse after her medicine had been administered, and on the day of her death Jane had neglected to supply her with hot-water bottles as directed, saying the doctor had told her not to do so, as the patient would die that day. Jane was turned out of the house, indignantly protesting at her treatment. After the funeral it was ascertained that much of the deceased's clothing was missing; some was found in Jane's box, but the police were not informed and she was not prosecuted.

*Another Marriage.*

Once, when short of cash and borrowing money from her landlady, she invited her to a meal in a fashionable restaurant. The invitation was accepted, and Jane paid the bill with a sovereign; on returning home the landlady found a sovereign missing from her purse. At another time Jane made the acquaintance of two students—friends. One immediately fell in love with her and they lived together, Jane alleging she had sufficient means to support them both. Within a week she had cast this one aside, and told him she loved his friend. A fight between them ensued, Jane was wounded with a knife, and two days later married the second student, by whom in due course she had a child. On leaving him she entered a lady's employment as nurse; three days later a bed was found to be on fire. A few days later a valuable diamond ring was missing and found in Jane's bed; shortly afterwards again, another mysterious fire broke out, and further thefts of money and jewellery occurred.

*Again Posing as a Nurse.*

Soon after leaving here she became nurse to an aged and infirm lady, securing the appointment by recommending herself for the post by telephone. She then attempted to obtain money from the patient's acquaintances under the pretence that the invalid was in financial straits, which was untrue. In this she failed, but it was found that large sums of money and jewellery belonging to the patient disappeared, and a bed in the servants' bedroom mysteriously caught fire. Two days before the patient's death Jane was summarily dismissed, the reason not being made public. She was watched, arrested, and charged with being in possession of clothing and jewellery belonging to her late patient; these Jane said had been given her by the deceased, and as no one was in a position to contradict this she was not proceeded against.

By this time sufficient evidence had accumulated to show she had committed bigamy with Mr. Z and the student: she was convicted and sentenced. Shortly after her release from prison, she was discovered disguised as a hospital nurse collecting subscriptions on behalf of an imaginary nurse supposed to be in trouble. In another district she incurred a hotel bill by fraud, was again convicted and sentenced. On the day of her release she telegraphed from a hotel to a gentleman in another city impersonating a lady friend of his resident elsewhere, saying she was in trouble in the city in which Jane was. The gentleman sent one of his family there, but the lady friend could not be found, and it was afterwards learnt she had never left her far distant home.

*Fourth and Fifth Marriages and More Adventures.*

Her next known adventure was to pose as a ward in Chancery who was to come into a large sum of money in a few months. A young gentleman who came to stay in the same hotel was told this by her; six days later they were married and returned to live with the youth's parents, with whom she became very popular. Whilst with them some wearing apparel which Jane obtained on approval was suddenly discovered to be on fire, but Jane was not suspected. By a fortuitous chance her whereabouts became known to the police, and she was arrested on a charge of bigamy with the youth, convicted, and sentenced to imprisonment. During this sentence she was temporarily transferred to a civil hospital for operation, and there became acquainted with the names of various nurses and medical men. On her release from prison at the expiration of the sentence she garbed herself in nurse's uniform and assumed the name of one of the hospital nurses who had left. She telephoned to the hospital for a character, and received an excellent one. She went to a boarding house in nurse's uniform, but owing to her conduct and conversation the boarding-house keeper, believing her to be an adventuress, ordered her to leave. During her short stay in this house several sums of money were missed; she was suspected, but sufficient evidence to prove her guilt could not be obtained. She then went to another town and, impersonating a certain lady, put up at a hotel and made herself, as usual, generally agreeable. She called upon a philanthropic lady, alleging she was greatly interested in a poor widow and her children, and asked for the lady's assistance; she was left alone in the room a few minutes and when she had

departed from the house the contents of a missionary box which was in the room were missing.

Somewhat later Jane telephoned to a gentleman holding an important position, claiming to have known him previously and mentioning many of his relations by name. He met her, and found her well-informed concerning his people. Subsequently she lunched with him and had rides in his motor-car. One evening when dining with him she feigned sudden illness and was conveyed to her hotel in his car. On inquiring as to her condition the following day he found Jane up, and she informed him she had to return to London at once to see a specialist. Instead she called up the widow of a well-known man on the telephone, and with a false story of being pestered with the attentions of an officer obtained a visit at her hotel from the lady. Jane in conversation, as proof of her genuineness, mentioned the names of people known to her visitor, eventually obtaining money from her sufficient to pay her hotel bill and buy a ticket for a long railway journey. A gold watch, alleged to have been her mother's but actually stolen from a hotel, she pressed upon the lady as security. After a short absence from this city, during which she obtained money by false pretences elsewhere, she returned; being arrested for stealing articles from the hotel she was sentenced to imprisonment. On her release she married a gentleman, who eventually left her after settling up various debts she had incurred as his wife. Still later she was convicted for unlawfully wearing a military decoration, and since then has served other sentences of imprisonment for fraud and stealing. In connexion with the latter charge it may be mentioned that she obtained a situation as matron in an institution and when dismissed for dishonesty a considerable quantity of the property belonging to the institution was found in her boxes.

### *Characteristics Noted when a Prisoner under Observation.*

I may now add a few of Jane's characteristics whilst under observation. Prison regulations to a certain extent limited her literary output, but in her letters to acquaintances, to myself, or to the officers, an elaborate style and consequential phraseology were used which she evidently considered were the necessary accompaniments of a superior education; the writing itself was good, neat, and legible. Throughout her career Jane has been fond of introducing French words and phrases in her letters, usually inappropriate and mis-spelt, and although she would have had one believe her to be a linguist, in reality she was not so. She showed such artistic ability that it was not unreasonable to suppose that with little effort a market might have been found for her work. She was described by an observant officer as being able to do anything with her hands. She was an excellent needle-woman when she liked, she could make artistic trifles from nothing more elaborate than paper and ink. She was capable of earning a good living had her abilities been coördinated with moral sense and stability of character. She did not impress one as being unduly vain, but she wrote letters concerning her extensive wardrobe and valuable jewellery, apparently hoping the officials would consider her a person of importance.

I have already said that Jane showed none of the artifices of the courtesan; indeed, she was at times rather untidy, but there was once a suggestion—which may have been erroneous—that her cheeks were tinted with the red dye from a book cover, a not infrequent method of decoration amongst female prisoners. Her affected airs of refinement and a somewhat exaggerated modesty were regarded as posing. She lied constantly and with much plausibility, for no adequate purpose. She could make mischief quietly, keeping herself in the background; she made efforts to play off one official against another—not always to gain anything herself thereby, but merely to create ill-feeling between them. On one occasion, in an attempt to cause trouble, she alleged that her wedding-ring was lost and seemed much put out about it, but some days later it was found in the book she was reading. I never saw her lose her temper—to have done so would have been out of keeping with her superior air—but she permitted herself to show some petulance at times. With other prisoners she would quarrel, subduing hardened offenders with her threats. She really preferred to be alone. As a hospital patient she would obtain medical extras, and then give them to other patients—not out of goodwill, but to create jealousy and discord amongst them. After being granted extra diet she would surreptitiously throw it away. She was apologetic when complaining of illness, but as her complaints were usually groundless her apologies lacked sincerity. As a matter of fact, she had enjoyed a fair measure of good health, had never been in an asylum, had never had any fits, and was not addicted to alcohol or drugs. She always considered herself the injured party in every dispute, but I have no reason to suppose she was revengeful.

I have before me some of her writing, which shows, perhaps unconsciously, the impression Jane wished to give others—i.e., that she was a brilliant and vivacious woman. I believe, however, that she has no clear insight into her own mental condition; she realises that her ability is largely responsible for her crimes, but does not appreciate that she is lacking in moral sense. She is an extremely painstaking and industrious woman when employed at work she fancies, but the ordinary routine work of everyday life, whether in prison or at liberty, she scorns. Even should she so desire, she can make no permanent friends, the regard of her fellows is soon destroyed by her conduct and deceit: indeed, she never seems to have made any effort towards true companionship. She told me that as a child she was not interested in her fellows, did not care for games, nor concern herself with dolls, but spent much time in reading. There is nothing in her history to suggest, nor could I detect, any genuine affection for any individual. That she desired sexual relations must be deduced from the frequency with which she sought men's society, which Jane herself stated was forced upon her by economic conditions, but this contention is not supported by her history. She attributes her criminal career to perverse sexual practices with her husband, in which she was made to take a part some considerable time after their marriage. This might be interesting were it true, but her delinquencies had already begun some years before the alleged occurrences took place.

Jane never seems to have had any genuine maternal affection, nor to have taken thought for her children's welfare, but to have left them to the care of others at the earliest opportunity. I have no evidence that she was at any time actively and directly cruel. Real gratitude was unknown to her, kindness she repaid with deceit; she was always unreliable. That she understood something of human nature is clear from her history and also from episodes in her prison life. That she could exercise a patient ingenuity and much industry in formulating and carrying out her schemes was also evident. That she could easily deceive people ignorant of her career is not remarkable, but I have reason to know she was successful in deceiving even when her full history was known. She has been described as an adventuress, and as is usual with this type she "worked" alone. That she loved adventure, change, excitement, was reckless as to the risks she ran, and regardless of consequences is clear: that the temporary success her audacity achieved was as heedlessly cast aside is also evident. She informed me she commenced stealing when at a convent school, taking fruit from the orchard trees, and was quite definite that she indulged in this in a more open and persistent manner than the other children. She also admitted that at this time she committed other trivial thefts, and it has already been related that she was dismissed from her last school for pilfering. Her sex delinquencies commenced at or about puberty; it is therefore possible to say that this and the acquisitive instinct were uncontrollable or uncontrolled from an early age.

*A Good Example of Moral Imbecility.*

Unlike many a recidivist, Jane has, I believe, never excused her repeated offences by alleging they were the result of the severity of the initial sentences of imprisonment passed upon her; her early sentences, in fact, were conspicuous for their moderation. Her career is not the result of an indolent nature drifting more or less passively into crime as the easiest way of getting a living, nor is it the outcome of the gambler's prompting, which so frequently causes crime; it is the inevitable result of active criminal desires constantly urging and seeking opportunity for the commission of crime, and constitutes, I believe, a good example of moral imbecility. Jane is a "luckless pot marr'd in the making," and well might she say:—

> "They sneer at me for leaning all awry;
> What! did the Hand then of the Potter shake?"

She complies with the four requirements of moral imbecility as laid down in the Mental Deficiency Act, 1913. "A person who from an early age displays some permanent mental defect coupled with strong vicious or criminal propensities on which punishment has had little or no deterrent effect." From childhood she has displayed, as shown in this narrative, strong criminal and also vicious propensities upon which repeated punishment has had no deterrent effect, and it can be safely predicted never will have any deterrent effect. Her delinquencies have lasted for a period approaching 25 years, and no one would hesitate to say they will persist. If we accept Mercier's doctrine that crime is due to temptation or opportunity, the environmental factor or stress, acting upon the inherent or constitutional factor, temperament, then Jane's incorrigibility appears evident. The constitutional factor is chiefly at fault, the environmental factor being insufficient to cause habitual crime in a person of normal or approximately normal temperament, and there can now be no prospect of change in her inherent mental constitution. That she is a woman of some talent, ability, and cleverness cannot be gainsaid, but she lacks discretion and fails in the higher mental level—viz., wisdom "which enables a man to regulate the more important modes of conduct in the more important affairs of life so as to achieve success in his career" (Mercier). By her intelligence she is able to gain a certain position, which through her lack of wisdom she is unable to retain. The instincts of sex, acquisition, and exhibition are uncontrolled, and result in sex immorality, fraud, and theft, in the wearing of her hair in a long false plait, and in her exalted impersonations. The maternal instinct is defective, the social instinct which should express itself in a desire for companionship, in consideration for and duty towards other members of the community, is undeveloped, the praise or blame of others, their approval or disapproval disregarded, altruism absent, the moral sense lacking. In these and in her failure in life are seen Jane's permanent mental defects, to these are due her anti-social career. That certain markedly anti-social lives are due to grudge formation or other mental conflict at an early age appears to be generally admitted, and one has known persistent criminal careers due to this cause. I was unable, however, to trace any such in my interviews with Jane. This was not surprising considering her ability for deception, and bearing in mind also the years which would have elapsed since such formation could have arisen; but I have been prompted to record her history, even at a time when the interpretation rather than the description of mental conditions is sought after, in view of the importance of moral imbecility and its admitted medico-legal difficulties. Some witnesses in court appear to rest their diagnosis on the turpitude of the particular offence with which the prisoner is charged, others to consider that all criminals are moral imbeciles, others again seem to hold the opposite view and to deny its existence apart from co-existing intelligence defect. The pitfalls are, however, lessened for that witness who only forms a diagnosis in conformity with the statutory definition.

It is usually only in such flagrant well-established cases as Jane's that the medico-legal witness is likely to obtain a sympathetic audience at the trial. It is when the unfolding of the case shows that the risk repeatedly run is out of proportion to the sought-for prize—the latter being neglected when obtained—that the jury are likely to be persuaded that the crime is due to a mental defect.

## A CASE OF MELANOMA OF THE CHOROID.

BY A. E. KEOWN, M.B. BELF.

SARCOMATA, such as described in the following case, usually originate near the optic disc and grow forward pushing the retina before them. I cannot find any account of choroidal melanomata not covered by retina or retinal vessels. This particular tumour was seen in the first instance by Mr. Parry Morton, of Dowlais, an optician, who has supplied me with the following note:—

"W. T., an engine-driver, aged 62, came to me complaining of discomfort in the left eye. On the nasal side behind the iris was an orange-coloured mass of the size of a lentil seed as seen by oblique focal illumination. It appeared to arise from the ciliary body or thereabouts. The fundus oculi and disc were normal. I warned the man that he had a most dangerous growth, that he must go at once to an ophthalmic surgeon, and refused to supply him with glasses."

This was in mid-August. Four weeks later he was seen by the present writer.

The whole pupil area was then occupied by a pale orange-coloured mass except a small space on the temporal side. There appeared to be a minute perforation of the sclerotic close to the corneal margin on the nasal side, evidently corresponding to the point of origin. The previous day he had seen Mr. Tudor Thomas, of Cardiff, who wrote that the tumour was a melanoma. Next day Mr. R. S. McClelland removed the eyeball in the Merthyr General Hospital, the patient at last consenting to the procedure as the sight of the eye was destroyed. All the conjunctiva and tissue near the perforation was removed, but the socket was not completely cleared as it was considered that the origin of the growth so far forward rendered so radical a procedure unnecessary.

The Clinical Research Association reported as follows:—

"The section shows a choroidal malignant growth which is a melanoma. The origin of the pigmented cells from one original pigmented layer of cuboidal cells is very well seen."

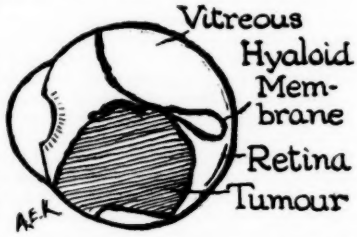


Diagram showing tumour pushing back hyaloid membrane.

The division of the eyeball into two nearly equal halves shows beautifully the origin of the tumour by a narrow base from the retina-free choroid between the ora serrata and the ciliary body. It did not therefore necessarily cause retinal detachment, and it was not covered by retina. The growth bends back over the retina towards the disc pushing the hyaloid membrane in front of it. In Haab's Atlas a melanoma is figured with an anterior origin but lifting the retina. In our hemispheres the retina can be seen in normal position. The microscopic slide shows typical cells, many of which contain much melanin.

The patient works with a powerful electric arc light suspended on his left and he has complained very much of the glare. He believes that the light had something to do with the causation of this trouble. The patient's opinion is of interest when one remembers the known effect of ultra-violet rays on the crystalline lens among men working in front of bright furnaces. The man is driving his stationary engine again. The stump is painless and can be rolled under the fingers. There is no enlargement of any abdominal viscus.

Dowlais, Glam.

# Medical Societies.

## ROYAL SOCIETY OF MEDICINE.

### SECTION OF NEUROLOGY.

A MEETING of this section of the Royal Society of Medicine was held on Nov. 10th, Mr. PERCY SARGENT, the President, being in the chair. Members of the Section of Surgery had been invited to attend. A discussion on

*The Treatment of Persistent Pain due to Lesions of the Central and Peripheral Nervous Systems*

was opened by Dr. WILFRED HARRIS, who said that persistent deep-seated pain, if accompanied by failing health, would always suggest malignant disease. He considered the causes of pain in the peripheral nerve-endings, and rapidly sketched the various forms of disease of the nerve trunks, posterior roots and their ganglia, the fillet or thalamus which gave rise to pain.

1. *Peripheral Causes.*—Dr. Harris said that neuro-fibrositis might be traumatic or rheumatic. The former had not been sufficiently recognised. He had once been consulted by a farmer for pain across the lumbar region, which had persisted with occasional acute exacerbations for 10 years, after a fall. Examination revealed a tender spot, and the patient was cured by the injection of a few drops of strong alcohol into this region. Lateral scoliosis might be associated with similar tender spots. Such neuro-fibrositis appeared to be due to inclusion of sensory nerve-endings in areas of slight scarring resulting from rupture of muscle or tendon fibres, or as the result of a chill; pain thus produced might occasionally persist for years until the nerve-ending was destroyed by strong alcohol. Trigeminal neuralgia was, he thought, probably due to septic neuritis of dental nerve filaments in the jaw. It was commoner in women than in men, on the right side than on the left, and in the upper jaw than in the lower. It was occasionally bilateral. In the early stages remissions commonly took place, but they became less frequent as the disease progressed. For the relief of this complaint drugs were useless, and the choice lay between alcohol injection of the Gasserian ganglion or of one of the main trunks, and operation (either gasserectomy or division of the sensory root of the fifth nerve behind the ganglion). Dr. Harris believed that alcohol injection of the ganglion produced as permanent a cure as the operation of gasserectomy. It had the advantage of being available for bilateral cases for which double gasserectomy was not permissible owing to the jaw-drop that would follow. Chronic non-paroxysmal neuralgia of either the upper or the lower jaw appeared to be limited to women usually of 15–35 years of age. It might persist for years and differed from true "tic douloureux" in not being relieved unless total anæsthesia was produced, either by injection, neurectomy, or gasserectomy; whereas a light anæsthesia from partial injection of the nerve trunk was often sufficient in the latter complaint. Geniculate neuralgia sometimes followed facial palsy when accompanied by herpes of the auricle. Severe spasmodic pain in the neighbourhood of the auricle, the angle of the lower jaw, and the upper part of the neck might persist for weeks or months. American authors had described the cure of such cases by section of the "pars intermedia." Glossopharyngeal neuralgia was very rare, but might simulate "tic douloureux" in the character and persistency of the spasms and pain. Sicard had reported section of the nerve behind the mandible as curing three cases.

2. *Diseases of the Nerve Trunks.*—Dr. Harris said that tumours at the base of the brain or naso-pharyngeal growths might simulate trigeminal neuralgia for a time, by irritation of the nerve, but the development of anæsthesia or motor palsy of the fifth nerve, or pressure symptoms such as diplopia or Eustachian deafness, would clear up the diagnosis. Gummatous neuritis of the fifth nerve might be recognised by persistent non-paroxysmal pain with the development of anæsthesia, a positive Wassermann reaction, and rapid improvement under active anti-syphilitic treatment. The symptoms of cervical rib pressure, also far commoner in women, were often produced by a first thoracic rib, so that a negative skiagram would not exclude rib pressure. This was suggested by varying though persistent pain in the neck and along the inner side of the forearm with perhaps anæsthesia of the ulnar border of the forearm and wasting of the hand muscles. Causalgia was a common occurrence during the war, but very rare in civil practice. It was often due to very slight lesions of the nerve trunks, and could usually be relieved by free alcohol injection of the nerve trunk well above the site of injury.

3. *Lesions of the Posterior Roots or their Ganglia.*—Post-herpetic neuralgia occurred mainly in patients over 50 years of age, and was confined to the region which had been involved in the herpes. Dr. Harris had recently had some success from alcohol injection in the Gasserian ganglion where the pain involved the first division of the trigeminal nerve. For post-herpetic neuralgia of spinal nerves posterior rhizotomy was not always successful. Hæmatorrhachis was an occasional cause of pain in the spinal nerve distribution. As regards the pain of tabetic crises he invited the experience of surgeons.

4. *Central Sclerosis of the Fillet of Thalamus.*—Intramedullary growths and syringomyelia and syringobulbia occasionally caused pain; the posterior inferior cerebellar syndrome caused persistent trigeminal neuralgia.

5. *Psychalgias.*—These were legion. In many cases they might be recognised by their lack of anatomical distribution, but in some cases they were only recognised when treatment had failed to cure the supposed lesion. Dr. Harris gave two instances of this sort of pain.

#### *A Different Classification.*

Sir WILLIAM THORBURN referred to the difficulty in judging the effects of treatment of pain. There is no accurate means by which the degree of pain could be measured. The mental effect of prolonged pain often caused the recurrence of pain sometimes in another part, after the original pain had been cured. Thus Sir William Thorburn had recently seen two cases of pain due to cervical rib which had been cured by operation; the patients returned later complaining bitterly of abdominal pain associated with floating kidney. Sir William Thorburn divided cases into three classes: (1) those in which there was a definite lesion, such as pressure on the brachial plexus; (2) cases where the lesion was less definite and was possibly situated in the posterior root ganglia; (3) those in which there was no definite lesion and which he called neuralgia. In the first class the only question was diagnosis, and early diagnosis followed by prompt and adequate treatment was curative. In certain cases, however, where pressure had existed for a long time, a neuritis might be set up which caused pain even after removal of the original cause. This explained the failure in some cases of operation for cervical rib which had been too long postponed. In the second class of case Sir William Thorburn included certain cases of painful amputation stump. Some of these were cured by removal of end-bulbs, but a percentage of cases remained where pain persisted after removal of the bulb and several inches of apparently normal nerve. These cases were, he thought, due to an ascending neuritis, and in some of them posterior rhizotomy was the only resort. In his opinion these bulbs were due to sepsis, and did not occur if the nerves were cut sufficiently short.

As regards causalgia, resection and suture of the nerve was not always curative. Sixteen of his 20

cases had been cured. Alcohol injection was perhaps more successful, but occasionally failed, and then posterior rhizotomy was the only available treatment. He had been very disappointed with the results in this disease. Of 47 cases who survived and could be subsequently traced, only 20 were cured, and the remainder had either no or only very slight relief. This again, he thought, was due to the fact that the neuritis had spread into the cord before operation. In one case he had seen definite evidence of this at operation for causalgia following avulsion of the brachial plexus. Cicatrices of the scalp sometimes caused pain long afterwards. Sir William Thorburn had cured many such cases by reflecting the painful area as a flap and interposing Cargile membrane between the flap and the skull. For trigeminal neuralgia two methods of treatment were available: (1) injection into the ganglion, and (2) Hutchinson's operation of resection of the portion of the ganglion attached to the second and third divisions. The first method in his opinion imperilled the eye, whereas Hutchinson's operation did not, and he had not known any recurrence after that operation. Post-herpetic pain in the spinal nerves could not, in Sir William Thorburn's experience, be successfully treated by posterior rhizotomy. For tabetic pain he had now performed posterior rhizotomy on 70 occasions with a mortality of seven, which he thought was too high. Of the 63 patients who survived, 50 were cured or much improved, while in the remainder the improvement was very slight. In the treatment of sciaticas and brachial neuralgias Sir William Thorburn said it was his practice to expose the nerve from end to end, and he had thus been able to discover and remove the cause in a large number of cases. On the whole, however, he regarded these cases as unsatisfactory, since most of them had already been treated by hydro-, electro- and other therapies, and only came to the surgeon when these had failed. In conclusion, he said that quite a considerable number of persistent neuralgias were due to spinal tumours, which were overlooked in the operable stage.

*Discussion.*

Dr. GORDON HOLMES said it was commonly taught that lesions of the central nervous system did not cause pain, but this was abundantly disproved by war experience. Injury to the tracts in the spinal cord undoubtedly caused pain. He had seen a case of tuberculous sclerosis with intense pain: the man was operated on by Mr. Sargent and section of the tract was curative, although the man subsequently died of generalised tuberculosis. Again the posterior inferior cerebellar syndrome was associated with pain in the opposite fifth-nerve distribution. Pain was common in pontine and mid-brain lesions and even in lesions as high as the thalamus. Pain in syringobulbia was often confused with that of ordinary trigeminal neuralgia, and cases of this disease had been needlessly submitted to alcohol injection and gasserectomy.

Dr. S. A. KINNIER WILSON said he was sorry that no reference had been made to metatarsalgia. He had successfully treated three of these cases by alcohol injection. He asked Dr. Harris whether he had found the spasmodic movements associated with "tic douloureux" disappeared after alcohol injection, and Sir William Thorburn whether he recommended posterior rhizotomy for the generalised lightning pains of tabes.

The PRESIDENT said that his experience of posterior rhizotomy had been disappointing, especially where it was performed for causalgia. The only hope for these cases was to deal with the nerve at a high level at an early stage. He quoted one case of causalgia in a phantom hand. The man was wounded in 1918, and came to him in 1920, after numerous operations had been performed, for intense pain in a phantom index finger and thumb. The brachial plexus was exposed by operation and 80 per cent. alcohol injected into the nerve trunks. On the assumption that the sympathetic nerves were involved he had dissected the coats off the subclavian artery and also resected the ramus communicans from the first dorsal nerve to the sympathetic trunk. On the next day a contracted pupil and enophthalmos proved that the sympathetic nerves had been sectioned, but the pain was no better. He then performed posterior rhizotomy with division of the postero-lateral tract on the opposite side to a depth of 1 mm., and this was curative.

*Reply.*

In reply, Dr. WILFRED HARRIS said that the movements in "tic douloureux" were of two sorts—those brought on reflexly by the pain and a chronic facial spasm. The former was cured by alcohol injections of the ganglion, whereas the second was unaffected but could be abolished by alcohol injection of the facial nerve.

Sir WILLIAM THORBURN said that his posterior rhizotomies were performed for definite gastric crises and not for generalised tabetic pains.

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## SECTION OF LARYNGOLOGY.

A MEETING of this section of the Royal Society of Medicine was held on Nov. 4th, under the presidency of Sir WILLIAM MILLIGAN.

*Laryngo-Fissure for Epithelioma of a Vocal Cord.*

Among a numerous series of interesting cases the chief discussion took place on one presented by Mr. E. D. D. DAVIS, the patient being a comedian, aged 46, on whom the exhibitor performed laryngo-fissure for an early epithelioma of the right vocal cord, but without removing the ala of the thyroid cartilage, and the right vocal cord excised. The patient had a rise of temperature for three or four days following the operation, but within three weeks he had left the hospital with a normal temperature and the wound completely healed. Five weeks after operation, however, a superficial abscess developed over the right thyroid ala as a result of perichondritis.

Sir STCLAIR THOMSON agreed that the man had been left with a satisfactory roomy glottis. The speaker favoured removal of the thyroid ala in every case of this type. He had done so systematically since 1917, since when he had carried it out in 15 cases, 14 of whom were still alive. One had had a recurrence, and had had partial laryngectomy done, from which he had recovered well. In two patients out of 50 there was a little stenosis, with stridor on hurrying or going upstairs, and in those the thyroid ala was not removed. Taking away this ala had the advantages that, instead of leaving a bare cartilaginous surface, with only perichondrium on its outer side—a cartilage which might necrose—a fleshy inner surface was left on the larynx, which healed up quicker than did the thyroid cartilage. Before he started to remove the thyroid ala he had an old gentleman patient who developed bronchitis almost at the same time as the laryngo-fissure was done, and the wound broke open. A tumour the size of a cherry appeared in the anterior commissure which was found to be an enchondroma. He was, however, still well five years afterwards. That was a trouble which might occur from leaving the thyroid ala.

Mr. W. ROSE said it had been his practice to remove the thyroid ala ever since it was recommended by Dr. Lambert Lack, and his experience had been entirely favourable; the ala could be removed at the same time as the growth.

Mr. DAVIS, in reply, said it had been his original intention to remove the ala, but it was such an easy operation and the airway was so good that he thought it was unnecessary. He had since regretted that he did not remove the ala, as the patient developed perichondritis five weeks after the operation.

Mr. HERBERT TILLEY related a remarkable case in which Dr. E. R. Morton's treatment of cross-fire X rays was successfully employed. A year ago a man had been operated upon for extensive malignant growth of the larynx, therefore the question to be decided was whether partial laryngotomy or laryngo-fissure should be done. There was very distressing stridor. It

seemed that all which could be done for him was to tracheotomise and leave him alone, but it occurred to him that Dr. Morton's cross-fire method might give some hope. Dr. Morton agreed to treat the case, and three months after the applications the whole trouble had disappeared from the larynx, the patient had easy breathing, and the skin over the front of the neck was as soft as could be wished.

## SECTION OF ANÆSTHETICS.

THE opening meeting of this section of the Royal Society of Medicine took place on Nov. 4th under the presidency of Dr. H. J. SHIRLEY. It was devoted to hearing and discussing a report by Dr. H. E. G. BOYLE on his recent visit, as the representative of the section, to the first meeting of the Canadian Society of Anæsthetists at Niagara, and to the meeting of the American Society of Anæsthetists at Boston in June last.

*Trans-Atlantic Methods.*

A practice followed to a considerable extent was to give the patient, some time before the operation was to commence, ¾ gr. of morphine, 1/100 gr. atropine, and 300 c.cm. of a 4 per cent. solution of magnesium sulphate subcutaneously into axilla or groin. Very successful anæsthesias were witnessed with gas and oxygen. Some passed the gas and oxygen over paraldehyde. The idea underlying this preliminary preparation seemed to be that the effect of the actual anæsthetic was intensified, and less of the drugs was required. Patients undergoing operations under local analgesia assured Dr. Boyle that under operation they felt no pain. Should distress appear, the method was to pass, by means of a motor, ether into the post-nasal space.

At the Harlem Hospital, New York, Dr. Lombard gave ethyl chloride for tonsil and adenoid cases. He sprayed the substance on to layers of gauze until the child became "muzzy"; he then poured more on, and covered the area with a sheet of rubber in which is a hole the size of a shilling, thus converting the open into a partially closed method. During the actual operation a suction pump draws all the blood away into a bottle, thus preventing it being swallowed. At Niagara the Congress was a great success, owing largely to the untiring efforts of Dr. McMechan, and those of Dr. Johnston, of Toronto. Great importance was attached, said Dr. Boyle, in Canada to taking blood-pressure readings of cases, as giving very valuable indications as to the patient's condition. If the blood pressure remained persistently low for half an hour, the patient usually died in a few days.

In this connexion considerable interest attached to Dr. McKesson's three degrees of circulatory depression. The first degree is that in which there is a 15 per cent. increase in the pulse-rate without a change in the blood pressure; or a 10 per cent. decrease in blood pressure without any diminution in pulse-rate. The second degree is that of an increase of 25 per cent. pulse-rate, with a 10 to 25 per cent. decrease of blood pressure. The third degree, which is recognised as that of definite shock, is that in which the pulse-rate is 100 or more and is ascending, accompanied by a falling blood pressure, reaching as low as 80 mm. of mercury systolic, and a pulse pressure of 20 or less. By these readings the anæsthetist can warn the surgeon of oncoming shock with greater certainty than if he had only the quality of pulse to guide him as indicated by the sense of touch. If the third degree lasted more than 20 minutes, said the demonstrator, the patient was practically sure to succumb. The method was demonstrated on a case in Boston City Hospital. At Boston the tonsillar operations he saw were done with the patient in the sitting posture.

Dr. Boyle praised the hospitals he visited, their equipment and organisation, particularly those at Montreal, Toronto, and Boston. At Toronto he found Dr. Johnston at the head of a most efficient staff of administrators of anæsthetics, and the representative described many of the operations and methods he witnessed. There seemed a likelihood that Toronto would lead the world in establishing a Chair in Anæsthetics: should that be so, it would be a great satisfaction to find Dr. Johnston as its first occupant.

The report was followed by a discussion, at the end of which the meeting approved a message of fraternal greeting and gratitude to both the societies in the Western Hemisphere which were concerned in the cordial reception of Dr. Boyle.

## WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

*Exhibition of Cases and Specimens.*

A CLINICAL meeting of this Society was held at the West London Hospital on Nov. 4th with Sir G. LENTHAL CHEATLE, the President, in the chair.

Mr. OSWALD ADDISON showed a case of Periosteal Sarcoma of the Femur in a young man under treatment with X rays. After three applications the tumour had markedly decreased in size. Mr. Addison referred to the notoriously bad results of amputation in these cases, and though he did not think X rays would prevent metastases, he thought this treatment preferable to operation.—Dr. LEONARD DOBSON cited a similar case under his care in which radium had been buried in the tumour in 1914. The patient had remained well since.

Mr. HOWARD STRATFORD showed a case of Myxœdema following X ray treatment after amputation of the breast for carcinoma. After a year's radiation of the scar and supraclavicular region signs of myxœdema had developed. The condition had been kept under control by administration of thyroid extract.—Dr. ARTHUR SAUNDERS thought that the X rays had in this case undoubtedly destroyed the secreting tissue of the thyroid.—Mr. ADDISON agreed and suggested that screening had not been efficient.

Dr. SAUNDERS showed an interesting series of cases illustrating thyroid insufficiency in children, the cases showing gradations from the mildest to the most severe types. He spoke of the almost miraculous results that could be obtained by the administration of thyroid in many cases of this kind.—Dr. SEYMOUR TAYLOR thought that the best method of administering thyroid was in the form of sandwiches of fresh sheep's thyroid. He thought that if tabloids were used the patients were apt to increase the dose without consulting their doctors, sometimes with harmful results.—In reply to Dr. VAUGHAN PENDRED, Dr. SAUNDERS said he thought that thyroid insufficiency was probably more common in children than was generally recognised, and that many fat dull infants were benefited by small doses of thyroid.

Mr. GILBERT CHUBB showed a series of cases of gunshot injuries of the face and head to illustrate the results of plastic operations for their relief. He pointed out in the case of reconstructive operations on the lips how rapidly a graft of ordinary skin would take on the red colour of the mucous membrane. He thought this might be explained by the great vascularity of the part. In dealing with defects of the cranium he favoured the use of the iliac crest for grafts.

Dr. J. BURNFORD showed a specimen of Streptotrichosis of the Lung in a man who died after nine months' treatment. Bronchiectasis had developed, but had improved under treatment with large doses of potassium iodide. The bases of the lungs were solid. The disease began with colitis, and Dr. Burnford thought the infection had probably been gastro-intestinal in origin. He alluded to the fact that streptotrichosis was more common than generally supposed. Dr. Burnford also showed a girl with Aplastic Anæmia. The blood picture was of the chlorotic type, and though the spleen was enlarged he did not consider the case one of true splenic anæmia. Infective endocarditis had been carefully excluded.

Mr. SANGSTER SIMMONDS showed a man with gunshot wound through the hip-joint in which ankylosis had occurred between the neck of the femur and the ilium above the acetabulum. The limb was adducted and progression difficult. Mr. Simmonds had removed the head of the femur and placed the neck in the acetabulum after division of the adductors. The limb was placed in the fully abducted position and firm ankylosis had resulted. The man could now get about with comparative ease.

Dr. L. S. BURRELL showed four cases to illustrate the results of artificial pneumothorax. The apparatus which was used in this operation was demonstrated.

Mr. NEIL SINCLAIR showed an Aneurysm of the Right Common Carotid Artery at its Lower End in a woman aged 64. No pressure symptoms were present, nor was there any indication of involvement of the innominate. X ray examination showed marked dilatation of the aortic arch; this fact,

together with other evidence of advanced arterial disease, in his opinion, contra-indicated operation. Mr. Sinclair also showed a man with an extensive syphilitic ulcer involving both sides of the neck. The Wassermann reaction was strongly positive. A similar but smaller ulcer was also present under the right axilla.

## NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

### *The Use of Anti-Gonococcal Serum.*

AT a meeting of this Society held at Liverpool on Oct. 21st, Mr. CARLTON OLDFIELD (Leeds), the President, being in the chair, Miss F. IVENS (Liverpool) read a paper on the use of anti-gonococcal serum as an adjunct to conservative surgery in gonococcal infections, basing her remarks on the results of its administration in 40 cases, in the majority of which salpingitis had been the prevailing feature. Nicolle's serum from the Pasteur Institute had been employed, administered: (1) by intraperitoneal injection during laparotomy; (2) by subcutaneous injection after dilution with normal saline; and (3) by vaginal serum packs alternating with packs of 10 per cent. salt solution mixed with 5 per cent. carbolic lotion. It was pointed out that the administration of salt solution at the time of serum injection diminished the incidence of anaphylactic phenomena. In the majority of cases the pus tubes were opened up and 20 c.cm. of serum injected into them or left in the pelvis. The tubes were not removed unless extensively damaged and the abdomen was closed without drainage. All the patients had made an immediate recovery and the results in cases of salpingo-oöphoritis, endocervicitis, and arthritis, and more especially in puerperal gonococcal infections, were excellent. A large number of cases followed up were found to be in good health, presenting a marked contrast to cases treated without serum. Three cases required further operation, but the possibility of re-infection was present. Miss Ivens considered that the results obtained warranted extended study with a reliable serum.

## SOUTH-WEST LONDON MEDICAL SOCIETY.

THE first meeting of the session was held at the Bolingbroke Hospital, Wandsworth Common, on Nov. 9th, when Dr. Strickland Goodall gave a demonstration on the Rôle of the Electrocardiograph in Practical Medicine. He gave a brief account of the discovery of the heart currents, and then described rapidly the evolution of the electrocardiograph to the present time. After explaining the modern instrument and describing the various leads, he passed on to consider the physiological electrocardiogram, associated its different waves with activity in definite parts of the heart, and explained how these waves became modified in structural changes of the myocardium. Dr. Goodall illustrated this point with special reference to mitral stenosis, showing how the electrocardiogram gave an accurate picture of the pathology of the disease in any stage. He next demonstrated the analyses of some of the more important arrhythmias—auricular fibrillation, flutter, sinus arrhythmia, heart-block, extra-systoles, and so forth. After detailing the chief features of these, he described in detail the diagnoses of defects in the conducting system, demonstrating how lesions could be located in any part of the bundle system. Dr. Goodall concluded by pointing out a series of conditions which could only be diagnosed by aid of the electrocardiograph, and indicated how this instrument could be used for judging of the effects of drug and other treatment and of the general progress of a case.

ROYAL INSTITUTION.—The ninety-sixth Christmas course of juvenile lectures, founded at the Royal Institution in 1826 by Michael Faraday, will be delivered this year by Professor J. A. Fleming, F.R.S., on "Electric Waves and Wireless Telephony," and will be given on the following days at 3 o'clock: Dec. 29th, "Surface Waves on Liquids"; Dec. 31st, "Waves in Air"; Jan. 3rd, "The Telephone"; Jan. 5th, "Electric Oscillations"; Jan. 7th, "Electric Waves"; Jan. 10th, "Wireless Telephony."

# Reviews and Notices of Books.

THERAPEUTIC IMMUNISATION IN ASYLUM AND GENERAL PRACTICE.

By W. FORD ROBERTSON, M.D., Pathologist to the Scottish Asylums. Edinburgh: E. and S. Livingstone. 1921. Pp. 278. 15*s*.

IN the first part of this book a series of brief chapters deal with bacterial infection as the cause of disease, with the facts regarding immunity that bear upon therapeutic immunisation, and with the bacteriological methods to be employed. Clear description of the apparatus is given and the preparation of culture and test media is well described. Only an outline of the facts which bear upon therapeutic immunisation is essayed, the reader being referred for full information to the well-known works of Muir and Ritchie, of Hewlett and of d'Este Emery. There follows a presentation, systematically arranged, of the differential characters of bacteria which must be identified in investigations designed to apply therapeutic immunisation in particular cases. Under this system the author points out that important pathogenic bacteria have been excluded from the list because therapeutic immunisation would have little or no application to the treatment of the conditions with which they are associated. It is frankly admitted that the system of classification is provisional. A brief description is added of the methods to be employed in the clinical investigation of infections, and, in dealing with the practice of therapeutic immunisation, a useful warning is issued against the random use of stock vaccines. While allowing that these have their rational use, Dr. Ford Robertson points out that even autogenous vaccines, in the hands of those who do not know how to use them, often do harm. More than the last half of the book is taken up with two long chapters dealing with bacterial infections amenable to treatment by therapeutic immunisation and with the circumstances of such treatment.

It is difficult to review a book whose suitability for any particular class of readers must be in question. The ground covered by the first part of the treatise has been covered by many text-books. Generous reference to some of these is profuse in the volume, but if the author's intention has been to appeal to students, we feel that such a class of readers would do better to consult the works to which Dr. Ford Robertson refers. The latter part of the work advances views which in many directions will not receive general support. It is quite well that the views should be set down for discussion, but they must be considered tentative. Under the heading of diphtheroid bacilli, for example, Dr. Ford Robertson prints a paper which he had prepared seven years ago pointing to the pathological importance of these bacilli, which he associated ætiologically with conditions which are not usually considered to bear that relation. Chronic infection by diphtheroid bacilli, he says, occurs especially in diseases of the nervous system, including certain types of neurasthenia, acute toxic insanities, dementia præcox, general paralysis, and tabes dorsalis. In the latter two he admits that the infection is perhaps always associated with syphilis. We may grant that we have no proof that infection of the brain by the *Spirochæta pallida* is a complete explanation of all the characteristic phenomena of general paralysis, but we must still require a good deal more evidence than Dr. Ford Robertson produces before his conclusions can be adopted.

He is aware, however, that his work is in the nature of a challenge to other workers, for in a prefatory statement he says that "numerous facts new to science are recorded and many heterodox opinions are expressed which are not likely to be accepted without a fight." We think that the fight which he anticipates is sure to come, and in certain places he

will be required to marshal the results of many years of industrious research very carefully if he is to emerge victorious.

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FRACTURES IN GENERAL, INDUSTRIAL, AND MILITARY PRACTICE.

Second edition. By JOHN B. ROBERTS, A.M., M.D., F.A.C.S., Emeritus Professor of Surgery in the University of Pennsylvania Graduate School of Medicine; and JAMES A. KELLY, A.M., M.D., Associate Professor of Surgery in the University of Pennsylvania Graduate School of Medicine. London and Philadelphia: J. B. Lippincott Company. 1921. Pp. 755. £2 2s.

Prof. Roberts and his collaborator have produced a commendable work on fractures, achieving a judicious blending of the old and new. For example, whilst quite a number of the classical type of illustration showing the displacement of bony fragments due to muscle pull have been retained, these are effectively overshadowed by many excellent radiograms of actual fractures. The authors are in no doubt as to the efficiency of certain technical methods which they themselves follow, but they have generously quoted from others, and have illustrated and described at length many different methods of treating individual fractures.

In a preface they emphasise 26 "cardinal points," all of which are sound except perhaps the uncompromising statement that "joint fractures should not be kept immobile longer than one or two days." However, the bare dogmatism of this rule which would seem to imply a negation of the doctrine of rest, is modified in the section of the text where individual joint fractures are dealt with. The efficiency of what are termed "contour splints," moulded to the actual region, and made of plaster of Paris, is stressed. The writers, in common with other modern fracture surgeons, have little use for the conventional wooden splint. It is interesting to note that certain well-known wooden splints, such as the Carr splint for Colles's fracture, are condemned wholeheartedly.

One of the best sections is that dealing with fractures of the lower end of the radius; here the importance of efficient primary reduction, and the maintenance of the normal curvature of the radius, are emphasised. The chapter on fractures of the shaft of the femur is less happily conceived, although the various technical additions which have resulted from recent war experiences are discussed. Two useful chapters are those on Obstetrical Fractures and on Industrial and Warfare Fractures. In the latter, there is an excellent résumé of the modern early treatment of the co-existing soft part injuries with reference to the eradication of wound infection. The treatise as a whole is well planned and readable.

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ZOOLOGY.

*Outlines of Zoology.* By J. ARTHUR THOMSON, M.A., LL.D. London: Henry Frowde, Hodder and Stoughton. Pp. 867. 18s.

*Zoology for Medical Students.* By J. GRAHAM KERR, F.R.S., Regius Professor of Zoology in University of Glasgow. London: Macmillan and Co. Pp. 485. 25s.

*An Introduction to Zoology.* By C. H. O'DONOGHUE, D.Sc., F.Z.S. London: G. Bell and Sons. Pp. 501. 16s.

OF these three elementary text-books that of Prof. Thomson has attained to the position of a seventh edition, which renders criticism somewhat superfluous, and also justifies the method of arrangement adopted by its author. In this there is no change; Dr. Thomson still gives a large mass of information, but a judicious use of small type draws attention from the less to the more important sections, and thus saves the elementary student from confusion.

Prof. Kerr, as the title of his book states, writes definitely for the medical student, and, therefore, perhaps lays more stress upon parasitic forms than he would have done in a book designed for a less specialised audience. The distinction is by no means overdone and other groups are treated quite adequately. A feature of this work is the large number of original illustrations drawn specially for Prof. Kerr, and certain of these, such as the nephridial organs (p. 309), renal tubule of vertebrate (p. 310), lung of fishes (p. 367), are usefully diagrammatic. In contrast with these, and excellent in their way, are elaborate drawings of the bird's feather (p. 428) and larval stages of Lepidosiren (p. 391), that South American dipnoid particularly associated with Prof. Kerr's important investigations.

While Prof. Kerr's text-book is written perhaps chiefly to meet the needs of the medical student, Dr. O'Donoghue's Introduction to Zoology is designed in the first place for the use of the science student of the University of London, though the author, who is a professor in the Canadian University of Manitoba, hopes that it will prove useful also to others. The greater part of the book is devoted to the anatomy and development of the frog, the dogfish, and the rabbit. The invertebrates (protozoa, hydra, obelia, lumbricus, and tænia) occupy only three of the 17 chapters. Dr. O'Donoghue does not ignore the general problems of zoology, such as variation, heredity, and so forth, but his manual differs from those of his colleagues in that he gives no bibliography to guide the student in extending his knowledge.

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EXTRA-UTERINE GESTATION.

By EDWARD SCHUMANN, Lecturer on Obstetrics, Jefferson Medical College, &c. London and New York: D. Appleton and Co. 1921. With 71 illustrations. Pp. 189. Price 21s.

THIS book has been written to present modern views regarding this complication of pregnancy, with special reference to the opinions prevailing among American gynæcologists and obstetricians on the subject. After a short historical summary of our knowledge of ectopic gestation, Dr. Schumann discusses its frequency and ætiology, and registers his opinion that in the majority of cases the condition is predisposed to by the end-results of tubal inflammation or by the pressure on the tubes of neighbouring neoplasms. He calls attention to the discrepancies in the statistics relating to the relative frequency of tubal rupture and abortion, and regards rupture as occurring nearly twice as frequently as abortion. The situation of the tubal pregnancy is regarded as being the most certain factor in determining the mode of termination of the pregnancy; the chapter on the pathology of the condition is well written and there is an interesting account of three cases of interstitial pregnancy which the author has had the good fortune to observe.

The succeeding chapter is devoted to recurrent and abnormal forms of ectopic gestation and conditions simulating it. The author doubts whether an ectopic gestation has ever been diagnosed by palpation before any hæmorrhage has occurred into it, and with this statement we are inclined to agree. In the diagnosis of the condition he lays most stress upon some degree of metrorrhagia, together with pelvic pain. Operation is strongly advocated in every case, since it is difficult to be certain that the hæmorrhage has ceased in any given case and will not recur. There is, however, a good deal to be said for the opposite policy of not operating in all cases, for instance, of peritubal hæmatocele; and it is unfortunate that this side of the question is not presented in sufficient detail to enable readers of this monograph to form their own opinion. There is no doubt that many patients recover from a tubal abortion without operation, and there is no evidence that in such cases early operation presents any ultimate advantages to the patient as compared with expectant treatment.

In the treatment of cases of advanced extra-uterine gestation, in which it is impossible to remove the placenta, Beck's plan of leaving the placenta in situ and allowing it to become absorbed is quoted with

approval. The results he quotes are certainly striking; he has collected 12 cases in which this procedure was adopted with only four deaths, whereas of 52 women in whom marsupialisation was practised 22 died. The conclusion is also arrived at from a study of Beck's statistics that the best time to operate is the thirty-eighth week.

Dr. Schumann's book contains a clear and interesting account of the present views with regard to ectopic gestation and will well repay reading.

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SYMPTOMATOLOGY, PSYCHOGNOSIS, AND DIAGNOSIS OF PSYCHOPATHIC DISEASES.

By BORIS SIDIS, A.M., Ph.D., M.D., Medical Director of the Sidis Psychotherapeutic Institute. Edinburgh: E. and S. Livingstone. 1921. Pp. 448. 21*s*.

Dr. Sidis was one of the first workers in America to use as a therapeutic measure the revival of lost memories, chiefly by means of hypnosis or hypnoidal states; this he calls psychognosis and he speaks with authority concerning the method. When he discusses other topics he arouses doubts as to how far his authority carries. He divides insanities into those of organic origin (organopathies) and those due to poisons or toxic products affecting the neuron (neuropathies). Having ruled out any psychological cause of insanity he classifies psychopathies (i.e., neuroses and psycho-neuroses) also in terms of neurons, speaking of "functions of which the personal consciousness is found on examination to have lost control by reason of neuron disaggregation and dissociation" (p. 100). *Mental* dissociation is a theory, useful in description or discussion; *neuron* dissociation, here presented as an anatomical fact, is a misleading speculation. Later on, when Dr. Sidis discusses aphasia and speaks of "the number and function of the systems of neurons involved" (p. 260), we cannot tell, even from the context, whether he is talking of pathological findings or purely imaginary processes.

On p. 319 he emphasises views which would be regarded by most psychotherapists as retrograde: "I must say once for all that they who try their ingenuity and fanciful symbolisation and mental conflicts in order to squeeze out some important meaning out of psychopathic symptoms in the present life adjustments of the patient miss the essential point of psychopathic states. Psychopathic symptoms are essentially meaningless." In many hysterias the present meaning and aim are so obvious that the casual observer tends to ascribe the symptoms to malingering, and one of the chief difficulties in treatment, which Dr. Sidis must surely recognise, is to bring about the patient's adjustment to present life.

In an appendix is reproduced a paper by Dr. T. W. Mitchell, from the Transactions of the Psycho-Medical Society, in which appear certain notes of interrogation which are not in the original; if they are interpolations by Dr. Sidis their origin should be made clear. An allusion to "medical dignitaries taking a regular bath in sexual filth" seems obsolete; the introduction in which it occurs is dated July, 1914, so that this is presumably not the first appearance of the book. The views presented in it were possibly worth consideration seven years ago, but psychopathology has advanced since then.

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DIAGNOSIS.

*Diagnostik innerer Krankheiten in Tabellenform.* Third edition. By Dr. A. J. CEMACH. Munich: J. F. Lehmanns. 1920. With 53 tables and plates. M.15.

As the author points out in the preface to the first edition, the symptomatology of disease of the internal organs is so complex that the accurate diagnosis of a case requires not only a knowledge of the clinical aspects of a malady but also of the signs and symptoms of the diseases with which it may be confused. There is a very general feeling of need for a concise expression of the principal signs and symptoms of internal disease. Dr. Cemach has made an interesting attempt to achieve this object by setting out the signs and symptoms of the commoner diseases in tabular form. The book consists of 53 tables, each table being devoted to the enumeration and comparison of the classical signs and symptoms of the more important diseases affecting a particular organ. Thus Table VI. deals chiefly with affections of the stomach, which are divided into diseases and neuroses of the stomach. The symptoms, findings on physical examination of the epigastrium, condition of the tongue, motor activity of the stomach, its contents, vomiting, appetite, description of the fæces, other symptoms, and the general condition, are set down in columns as they occur in acute gastritis (simple and toxic), chronic gastritis, atony of the stomach, simple and malignant ulcer and stenosis; then follow the neuroses—namely, gastralgia, gastric neurasthenia, secretory neuroses, and nervous vomiting. In the last column of the table the most important fact or facts in diagnosis are stated for each complaint.

The author's method is to choose a type symptom-group for the diseases of each organ and to give a bird's-eye view of the variations in the components of the symptom-group that are characteristic of the more important diseases of that organ. Separate tables deal with certain important single symptoms, such as dyspnœa, hæmaturia, and ascites. Infectious diseases are dealt with separately. Within the limits that the author sets himself he succeeds in presenting his subject in a concise and useful form.

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THE STAGES OF HUMAN LIFE.

By J. LIONEL TAYLOR, M.R.C.S. London: John Murray. 1921. Pp. 377. 18*s*.

THIS book appears to have been written with the amiable design of helping other people to lead happier and more efficient lives by persuading them to study what they ought to do in order to keep healthy. But what the author has to say is so common-place and is set out with such obscure prolixity that we doubt whether he will achieve his purpose. He might well reconsider his intention to publish further volumes on the same topics.

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## JOURNALS.

JOURNAL OF LARYNGOLOGY AND OTOLOGY, September and October, 1921. Vol. XXXVI., Nos. 9 and 10.—In the September number Mr. W. G. Howarth discusses operations on the frontal sinus; he finds the intranasal operation useful in recent cases but unsatisfactory in those of chronic suppuration, and prefers to remove the floor of the sinus, together with the anterior ethmoidal cells, through an external incision, thus establishing free drainage into the nose; the anterior wall and the mucous membrane are left intact, and the wound is sutured.—Prof. F. Hobday describes the operation of stripping the ventricles as performed for vocal cord paresis in the horse.—Dr. W. S. Syme mentions a method of treating asthma by application of 10 per cent. silver nitrate to the bronchi through the bronchoscope; Mr. J. L. Aymard describes the use of a small electric torch placed inside the mouth to detect bleeding-points after dissection of the tonsil: and Dr. C. McNeil reviews the present state of the theory of asthma as an anaphylactic phenomenon.

The October issue contains an article by Mr. T. M. Hovell, in which he claims that the majority of enlarged tonsils in children are not diseased, and that in these cases the proper treatment is the removal of the projecting portion with the guillotine.—Sir StClair Thomson gives a short account of the usual site of origin of intrinsic laryngeal cancer.—Drs. P. and E. Watson-Williams describe a method of exploring the posterior ethmoidal cells; Mr. F. Holt Diggle and Mr. F. B. Gilhespy contribute an analysis of 20 consecutive cases of acute mastoiditis treated by B.I.P. and primary suture with very good results; and Dr. Neil MacLay relates a case of osteomyelitis following an intranasal operation for sinus-suppuration with eventual recovery.

# THE LANCET.

*LONDON: SATURDAY, NOVEMBER 19, 1921.*


## Hospital Finance.

A STATISTICAL report of the ordinary expenditure of 112 London hospitals for the year 1920 has been issued during the week by King Edward's Hospital Fund for London, and can be bought [1] for 1*s.* 6*d.* This report is the latest of a series initiated in 1903, but first made public in 1908, and in it may be found, by anyone with eyes to read figures, a plain record of the cost of the voluntary hospital system as it exists to-day in the metropolis, and, incidentally, of the work done by the voluntary hospitals. The time is propitious for a comparison between pre-war and post-war conditions, and Mr. H. R. MAYNARD'S crisp and lucid prefatory note sets out the total work and expenditure in 1920 alongside that in 1913; 1913 being the last year when peaceful conditions prevailed, and 1920 being the first year in which the fluctuations due to admission of naval and military patients have ceased to disturb civil hospital life. In brief, the position is this: Just over 1000 more beds are available in 1920, and of these nearly 700 are continuously occupied; there are 20,000 more in-patients and 50,000 more new out-patients; but while the increase in work inside and outside the wards amounts respectively to 7 and 30 per cent., the ordinary expenditure of the hospitals has leaped up in the seven years by 135 per cent. In other words, the metropolitan hospitals cost for about the same work two and a third times as much in 1920 as in 1913. It would be convenient still to regard this tremendous situation as an emergency, but it would be foolish and cowardly to do so. The situation must now be faced with a view to its long continuance, and faced straightly and squarely; and with this in view, we set down as shortly as possible in tabular form the main facts of work done and cost incurred in the ten different groups into which the voluntary hospital work in London naturally divides.

| Group of hospitals.* | Average number of beds in daily occupation. | Average annual cost per bed. | Average number of days each patient was resident. | Total out-patient attendances (in thousands). | Average cost per attendance. |
|---|---|---|---|---|---|
| Larger General— | | | | | |
| With Medical Schools.. | 3867 | £199 | 19 | 2661 | 19*d.* |
| Without Medical Schools | 1079 | £163 | 24 | 962 | 14*d.* |
| Smaller General .. | 724 | £156 | 23 | 561 | 14*d.* |
| Consumption .. .. | 545 | £143 | 55 | 126 | 35*d.* |
| Women's .. .. .. | 258 | £158 | 20 | 95 | 19*d.* |
| Children's .. .. | 604 | £152 | 24 | 467 | 16*d.* |
| Ophthalmic .. .. | 220 | £115 | 14 | 269 | 14*d.* |
| Epilepsy .. .. .. | 321 | £141 | 64 | 124 | 19*d.* |
| Cottage .. .. .. | 304 | £133 | 23 | 59 | 9*d.* |
| Lying-in .. .. .. | 337 | £119 | 15 | 133 | 19*d.* |

* St. Bartholomew's Hospital and the Cancer Hospital are not included in this table.

[1] From Messrs. Spottiswoode, Ballantyne and Co., Ltd., 1, New Street Square, London, E.C.4.

It will be seen that the average annual cost per occupied bed at a large general hospital is in the neighbourhood of £160 when there is no medical school, or £200 when the hospital is also a teaching centre. The average cost per out-patient attendance is similarly in the neighbourhood of 1*s.* 2*d.* or 1*s.* 7*d.* We hasten to add that certain variable charges are not included in these figures, which are strictly accurate for comparison and only substantially accurate as totals. The cost naturally varies as between general and special hospitals of various kinds; in ophthalmic and lying-in hospitals, at which the usual stay is about a fortnight, the average cost is materially less; but within the several groups the variation in cost is very noticeable, and in the case of general hospitals with teaching schools varies from the norm of £200 to the extent of nearly £50 above and below. The report does not suggest that the lowest expenditure is intended to be taken as a model. It is not always that the lowest contractor's tender is accepted by the architect. But a primary object of publishing the comparative tables is that each hospital committee may reduce as far as possible that part of the increase in cost which is not represented by an increase in the quantity or quality of the work done. The Cave Committee, commenting on the striking differences in the expenditure between hospitals of like size and character, admitted that cost per occupied bed is at best an unsatisfactory criterion of value. The average period of in-patient treatment differs strangely from institution to institution, one teaching hospital in London keeping its patients on an average twice as long as another; and there is a very cogent plea entered by one hospital that its average weekly cost has increased for the reason that patients are transferred by motor ambulance to a continuation hospital in the country as soon as they can be moved, this transfer implying increase of cases at the hospital at their expensive stage. Granting the plea, added expense is just so much evidence of added efficiency and economical use of available hospital accommodation. Other allowances must be made in individual cases. At some hospitals articles are manufactured by direct labour, which at others are put out to contract; a number of London hospitals require patients who are not poor to provide certain articles of food; one hospital is staffed by a nursing sisterhood; paying beds at many hospitals bring up the expenditure.

But when all these sporadic differences have been given their due weight, we come back once more to the central and incontrovertible fact that the increased cost of living has hit the hospitals precisely in the same way as it has hit the private citizen, and for the public as well as the private consumer the reduced cost of living, of which so much has been heard and so little seen, had not taken effect at all during the year 1920. The largest London hospital speaks of reduction in the price of milk, but of increased cost in every other particular. Economy in the true sense is as urgent for the hospital committee as for the private citizen, but we doubt whether the average figure of £160 a year per occupied bed can ever again be substantially reduced. Outside London even that figure has in fact nowhere been reached. In some hospitals a more frugal regime may level down what a greater efficiency in others will level up; for efficiency will often imply more special departments, whatever their expense. Let this figure be accepted as the norm of expense and the solution of hospital finance be looked for where the Cave Committee indicated that it was to be found—namely, in

payments made by the class which uses hospitals. Whether the wage-earning and lower salaried classes prefer to pay for their treatment in advance when they are well or to wait until they require it, that remains to be determined. The present month witnesses a crucial experiment in medical providence. But the problem of voluntary hospital finance in London can be solved and the solution is brought one stage nearer by this admirable report.

## The Treatment of Persistent Pain.

DISCUSSIONS on the subject of pain and its treatment will always command the attention of the medical profession. For one person who may stoically endure suffering there are a hundred others in whom the slightest twinge is enough to upset equanimity and to lead to the seeking of medical advice; and should the pain become persistent nothing calls for greater fertility of resource than its successful treatment. Cure, as always, depends on recognition of the underlying pathogenic process, and this in turn is based on ætiological knowledge and on ability to assess the temperamental or constitutional element in the individual concerned. For pain, being essentially a subjective phenomenon, can be gauged objectively only by its accompaniments, and if these are wanting we have no criterion to aid us, no touchstone to indicate unfailingly its unseen and intangible existence; we must either believe or distrust our patient. At the interesting and helpful discussion on the treatment of persistent pain, held at the Section of Neurology of the Royal Society of Medicine (see p. 1057), Sir WILLIAM THORBURN emphasised the disadvantage under which the practitioner labours in having no objective measure for pain, but it is not clear that with it the task would be lightened. As the sufferer of old declared that "whereas I was blind, now I see," and cared nought for either pathological or therapeutic process, so the patient with symptoms of pain asks for no more than its relief or removal; in the absence of evidence to the contrary we must accept the actuality of his suffering, and if he says that with our treatment it has vanished we must just accept that too.

The contribution to the discussion provided by the opener, Dr. WILFRED HARRIS, who speaks with authority, was probably not intended to furnish a complete précis of the causes of persistent pain in diseases affecting the nervous system directly, yet it contained a sufficiently appalling number of conditions, each one of which is essentially painful, and for the relief of which skilful devotion on the part of the practitioner of medicine or surgery is required. Dr. HARRIS avowed himself an enthusiastic exponent of the method of alcoholic injection for many of these, ranging from the local points douloureux of neuro-fibrositis to the massive neuralgias of the trigeminal or the sciatic nerves. Through his hands some two or three hundred cases of trigeminal neuralgia have passed, and the failures constitute apparently only an insignificant minority. Sir WILLIAM THORBURN, too, reported numerous cases of the same condition cured either by this method or by the surgical procedure advocated by JONATHAN HUTCHINSON. From these two communications it may be gathered that the radical cure by gasserectomy is rather falling into desuetude; apart from its seriousness, it presents several disadvantages, one of which is its inapplicability to bilateral cases, at least if the motor branch of the fifth is to be avulsed with removal of the ganglion. Be this as it may, tic douloureux has lost its terrors, and no one need ever again be driven to suicidal extremities, as has regrettably been the case on occasion in days gone by. Causalgia, another variety of persistent pain, largely the aftermath of the war, also received a considerable amount of attention. Here the record was possibly not quite so satisfactory, but on the whole we may learn that it, too, can be cured. Failure to realise the importance of the conception of ascending neuritis in this connexion probably accounts for a certain number of non-successful interventions. If alcoholic injection is utilised it should be made at several points well on the central side of the lesion, and if neurectomy is practised the proximal end of the divided nerve should be treated with alcohol injection also. There remain, however, forms of persistent pain in nervous disease that are unfortunately much less amenable to therapeutic procedures, notably the variety described as central pain, of which at the discussion Dr. GORDON HOLMES gave a diagnostic description. He alluded to the kind that sometimes occurs in cord lesions, an account of which he contributed to the Osler *Festschrift*; in certain types of thalamic lesion, also, central pain is an only too conspicuous feature in the clinical picture. No really scientific method of treatment has as yet been evolved for such distressing cases, due as they are, if a recent theory of their origin be accepted, to release of function; in this respect they are akin to certain cases of release-phenomena on the efferent side, which similarly have proved to be peculiarly difficult to modify therapeutically.

For persistent pain originating in the proximity of dorsal root ganglia and not to be reached by alcoholic injection, the operation of dorsal rhizotomy received considerable support from Sir WILLIAM THORBURN; in other, even more inveterate, cases, the President of the Section counselled the adoption of the operation of intramedullary section of the spino-thalamic tracts in the ventrolateral column of the cord, a procedure which can only be resorted to when other methods fail and when the outlook is in any event grave. Should this be unsuccessful, we suppose the neurological surgeon, daring though he be, will not advise destruction of the thalamus by electrolysis, or excision of the sensory cortex, nor need he, for as far as the latter is concerned the representation of pain in a cortical sensory area is somewhat doubtful. If pain is to be chased in this fashion from periphery to centre, inability to effect a cure can in the last resort be set down to the elusive nature of the sensation; the residual group of the topoalgias, or psychalgias, as Dr. HARRIS called them, can be made the receptacle of the failures. As useful as a discussion on treatment would be one devoted to the differential diagnosis of psychical from somatic algias. Various criteria and tests notwithstanding, it is often a matter of great difficulty to distinguish the psychical from the physical, and accurate diagnosis demands considerable nicety and acumen. No contributor to the discussion at the Section of Neurology spoke of the treatment of psychalgia, from which one would not like to infer that neurology ignores painful mental cicatrices altogether. None the less the omission is noteworthy if it is to be taken as signifying indifference to a very large class of case of a really curable sort. Inability to ameliorate or relieve pain of organic central origin casts no discredit on neurological methods, for there is a limit to their applicability, but once diagnosis is satisfied with the non-organic nature of a particular pain its cure should be a matter of course. The lines to follow in such instances are doubtless familiar to the expert, but the practitioner would be grateful for help in this respect.

## Nightshade.

THE series of cases of belladonna poisoning, notes of which have been appearing in our correspondence columns, brings before us two striking points in the toxic action of this drug. First, the capricious way in which it selects its victim; and, secondly, the way it spares its victim when it has brought him to death's door. Many of us have had experience at any rate of minor cases of poisoning such as that of a patient who, after the application of a belladonna plaster or of the liniment, has a widespread erythematous rash, or loses the power of accommodation so completely that he or she—it is generally, of course, a female patient—avers blindness. Dr. D. FIRTH and Dr. J. R. BENTLEY, in the case related in THE LANCET of Oct. 29th (p. 901), gave a more unusual method of absorption, a method which may well have been the cause of some of the unclassified cases of rabbit poisoning in the past. Atropine is rapidly absorbed and rapidly secreted, mainly by the urine, so that in this case the rabbit had probably taken the herb recently. On the other hand, patients, delirious from atropine, and even those who have reached the stage of the somnolence which follows delirium, frequently recover. The poison works itself off in sleep, and the patient who has seemed in danger wakes as from a dream. While the opium case frequently does badly, the patient who seems to have a corresponding depth of poisoning from belladonna does better than the medical attendant might expect. Of course, there are a certain number of deaths. In the Registrar-General's causes of death in England and Wales for the nine years 1911-19 102 deaths are recorded (accidental and suicidal) in which belladonna and hyoscyamus apparently played some part. Of recent years pharmacology has cleared up the active principles of the belladonna series, so that now we have little to consider but the isomers atropine and hyoscyamine, and the closely allied hyoscine or scopolamine. The two first stimulate the brain centres and paralyse nerve terminals, the last depresses both centres and terminals. The various species of datura are now recognised to owe their active properties to these alkaloids. Poisoning by any species of datura must be very rare in Britain, but ISHMAEL states, in the *Practitioner* of July, 1915, that in Cairo datura poisoning is so common that it occurs in frequency next only to acute alcoholism, and the symptoms are those of belladonna poisoning as regards the dilated pupil, the joking delirium, and the rapid recovery. He further writes, "I have not seen a fatal case, though many on admission were and remained for some hours on the verge of death."

BRITISH ORTHOPÆDIC ASSOCIATION.—The annual meeting will be held on Dec. 2nd and 3rd, at Liverpool, under the presidency of Sir Robert Jones. On Dec. 2nd, the morning session will be held at the Liverpool Medical Institution, where, at 10.30 A.M., a discussion on "The Late Results of the Treatment of Congenital Dislocation of the Hip" will be opened by Mr. H. A. T. Fairbank, followed by Mr. E. Laming Evans. Mr. C. Thurstan Holland will give a demonstration of radiograms of bone and joint affections. The afternoon session will be held at the Royal Southern Hospital, where Mr. T. R. W. Armour will give a demonstration of operations and cases at 2 P.M. On Dec. 3rd, at 9.30 A.M., a short paper on a series of endosteal tumours will be read by Mr. Harry Platt. A demonstration of endosteal tumours and bone cysts will be given by Mr. R. C. Elmslie, and a paper on Function in Relation to Repair in Bone will be read by Mr. D. McCrae Aitken. In the afternoon visits will be paid to Heswall and Leasowe Hospitals.

# Annotations.

"Ne quid nimis."

## SURGICAL DRAINAGE.

THOSE who have followed surgical practice during the last 20 years have observed varying fashions in the methods of drainage, and even now there is no fixed rule of teaching. In our issue of Oct. 29th Mr. F. D. Saner judiciously discussed the first principles involved in the treatment of acute suppuration and recalled the fact that drainage benefits largely by relieving tension. On the general question of drainage Mr. Saner suggested that the prominence given to several very attractive but accessory lines of treatment such as antiseptics, tissue solvents, serums, artificial hyperæmia, has tended to divert us from consideration of the main principles. All surgeons of wide clinical experience will agree that rest and relief of tension are the most important points to attend to in a case of spreading inflammation. In dealing with large serous cavities, such as the peritoneum and pleura, other factors intervene. The main principles must be fulfilled, yet opinions as to the technique of abdominal drainage still differ greatly. It is not so long since any patient suffering from spreading peritonitis would leave the theatre with many rubber tubes projecting from the abdomen, like quills upon the fretful porpentine. This was the time when futile attempts were made to flush the peritoneal cavity free from infection by copious streams of saline solution.

Such methods, since they involved the neglect of the natural reparative processes of the peritoneum, were scientifically unsound and practically unsatisfactory. Later there arose the school which taught that the peritoneum could take care of itself in the presence of infection, so long as the main part of the gross exudate was removed by operation; this assertion was backed by experimental proof, which showed that drainage-tubes inserted into the abdominal cavity did not drain the main cavity for more than 12 to 24 hours owing to the formation of adhesions. Clinically it was found that the peritoneum could cause absorption of large masses of blood-clot in cases of ruptured tubal gestation. L. S. Dudgeon and P. W. Sargent showed that such clot was frequently infected by staphylococci. Further it was shown that even gross contamination of the peritoneal cavity, as evidenced by turbid fluid or lymph or even pus, could sometimes be successfully absorbed without drainage. But the question of closing the abdomen in the presence of infection is still sub judice. Mr. Saner voices a common view when he regards it as largely a matter of judgment whether the abdomen should be closed and the patient asked to deal with the remainder of the inflammatory process. If tubes are inserted, he says, it must be on the understanding that their purpose is not drainage, but an attempt to create a temporary track or line of least resistance. Possibly it is too great an assumption that the insertion of a tube merely relieves tension. There are cases of peritonitis in which much fluid is secreted and few adhesions form. Following perforation of a gastric ulcer there is often such free drainage from a pelvic tube for several days that no one can believe the fluid to come merely from the track of the tube. Experiments upon the formation of adhesions made upon normal dogs need to be checked from the experience of disease and surgery upon human beings. Peritoneal exudates vary greatly in their lymph-forming powers; ascitic fluid and some forms of inflammatory exudate do not tend to form limiting adhesions so quickly, and will continue to drain through a tube for a longer period than the prescribed 48 hours.

In judging how and when to drain the abdomen one must therefore consider the intensity of the infection, and the fibrin-forming or clotting power of

the exudate. Where there is much lymph, drainage is unlikely to be of benefit for more than a few hours; where the infection appears virulent and there are few adhesions it would be dangerous to close the abdomen entirely. It is likely that in the future the surgeon will be guided by the naked-eye estimate of the clotting process and a microscopical examination of the fluid to determine the resistance offered to bacterial invasion. D. P. D. Wilkie has shown [1] that it is possible by a rapid microscopical examination of the peritoneal exudate performed in the theatre, to form an estimate of the resistance offered to infection, and thereby to judge the proper course to pursue. Such a proceeding might lead to a further advance in abdominal drainage, comparable to that achieved by a study of the mechanical factor of gravity which resulted in the adoption of the Fowler position. It is time for a collation of available experience.

## MURDER BY MEANS OF BACTERIA.

THE rôle of bacteria as friends and enemies has not yet been fully estimated. Lempp, in a recent issue of the *Archiv für Kriminologie* (Vol. lxxiii., Parts 3/4), has an interesting article on the homicidal employment of bacteria, which is at present topical in view of certain proposals for the scientific development of warfare. Glancing at ancient literature, for instance Thucydides's account of the Athenian plague, and mediæval history, he pronounces, naturally enough, that these reports of pestilence spread through the action of enemies are in the great majority of cases merely fanciful. Just as baseless are the tales of aviators dropping bon-bons containing pathogenic cultures, or of laboratory workers contaminating water-supplies, which were recently given currency by, and perhaps often originated in, the sensational press. He states that on the German side such reports received for the most part immediate official investigation and discountenance. Probably the only authenticated instance of the use of pathogenic bacteria in warfare is, curiously enough, the practice of the warriors of the New Hebrides, of dipping the points of their weapons in marsh mud, which contains many tetanus spores. Equally scanty is indubitable evidence of murder by the means under notice; for probably there are but two properly recorded cases; and the second of these, that of the druggist and artist Hopf, did not go beyond an attempt. In 1914 Hopf was convicted of poisoning his first wife with arsenic, and of attempting to murder his third one by means of typhoid and of cholera germs. The latter infection was quite abortive, and examination of the culture in his possession showed it to have lost all virulence. The typhoid bacilli, on the contrary, were extremely pathogenic, having particularly high agglutination, a quality evident also in a strain isolated from the blood of an attendant, who also sickened, upon the wife. It was suspected that Hopf infected some of the entourage in order to give the impression of an ordinary small epidemic. Five days after poisoning his wife's food he began to take her temperature regularly: it duly rose two days later, but she recovered. He had caused her to make a will directing that her body should be cremated. The cultures—to the number of 30 within nine months—he had obtained from a private laboratory, asking particularly for the most virulent strains.

Accounts have appeared in American newspapers of murders, or attempted murders, in the United States by means of bacteria, the only specified kind being again typhoid bacilli; the statement even being made that it had been proposed to erect in Chicago—a city with one of the worst records for murder in the world—an institute expressly for combating this particular crime. However, the only documented example of a fellow to Hopf is that of a Dr. Pantschenko, who, bribed by a relative (by marriage) of the victim, murdered a rich young Russian by injecting, not bacteria, but a bacterial product—namely, diphtheria toxin. The injection was pretended to be of spermin, for therapeutic purposes, and the defence was an admission that the syringe might have been not properly clean, thus causing fatal septicæmia. Septicæmia was, indeed, the diagnosis first arrived at, by an independent medical man, while a second one took the condition for septic gangrene. The site of injection became bluish-black, the temperature rose to 40° C., and death followed in a week. There were two autopsies, the second only revealing the truth, by means of the discovery of a detachable grey membrane in the pharynx, of cardiac dilatation, and of peculiar thinning of the skin at the site of injection, appearances closely paralleled in ad hoc experiments on animals—namely, guinea-pigs—which also died on the seventh day. It was proved that Pantschenko had obtained diphtheria toxin from a laboratory, and also, on a previous occasion, cholera endotoxin and cholera bacilli, a poison suggested by the instigator aforesaid. Pantschenko was sentenced to 15 years' forced labour. The paper concludes with a review of current legal precautions against such crime, which seem in many countries to be altogether lacking, a state of things which its apparent great rarity does not wholly excuse.

[1] Internal Clinics, vol. iv., Twenty-second Series.

## THE WHITE LEAD QUESTION.

THE appearance at the present moment of a book [1] dealing with white lead is opportune, since the question is being keenly debated as to whether the use of this material in paints should be interdicted by civilised nations (see THE LANCET, Nov. 12th, a Report of the International Labour Conference at Geneva). The author, Mr. F. L. Cantineau, who is frankly and wholeheartedly a prohibitionist, presents his case as an advocate rather than as a judge; moreover, when dealing with the clinical aspect of the case, he suffers from not being a medical man. But we find here a useful summary based for the most part upon government inquiries and investigations carried out in many countries. All lead compounds, whether soluble or insoluble, are held to be poisonous; while, of them, white lead—i.e., carbonate of lead—is considered to be the most poisonous, and to claim most of its victims from among painters. Indeed, the number of deaths due to lead poisoning among painters is found to exceed that occurring in all other industries put together; nor does the damage cease there, since lead absorption, even to a slight degree, predisposes the victim to other diseases. We regret to find the skin placed in the forefront as a portal of entry for lead, the digestive system placed second, with the inhalation of lead dust third, since Dr. T. M. Legge has incontestably demonstrated that the order should be exactly reversed. Similarly, the author is at fault in speaking not unfavourably of the so-called electrolytic treatment of plumbism, which appears to possess no value. Mr. Cantineau is at his best when pointing out the almost insurmountable difficulties attending efforts to protect painters while working, for example, in private houses, from risk of lead poisoning, so long as paints continue to contain lead. The question as to whether illness among painters arises from breathing the vapour of turpentine and whether such illness may not have been ascribed to lead poisoning (an opinion recently put forward in this country by Sir Kenneth Goadby) is discussed by Mr. Cantineau at some length. Manufacturers of white lead, wishful to preserve their industry from destruction, have certainly attempted to make turpentine a scapegoat; the position is, however, difficult to accept when lead poisoning disappears, while paints containing no lead, but turpentine as before, are employed. The painter may be exposed to two risks; is that a reason for not abolishing one? If turpentine is toxic, we can turn our atten-

[1] "La Céruse." F. L. Cantineau. 1921. Pp. 480. Paris et Liége: Librairie Polytechnique.

tion either to finding a substitute or to rendering it non-toxic.

The second part of the book is an excellent historical account of the fight to abolish lead poisoning among painters. France has led the way, for there the campaign started at the end of the eighteenth century, was active throughout the nineteenth, and became acute at the commencement of the present century. It finally culminated in France in 1909 in a law prohibiting the use of white lead, linseed oil containing lead, or of any material containing white lead for painting the inside or outside of buildings. A period of five years was given before the law should become operative, and the war intervened. The law was not enforced, and even now that the war has been over nearly three years, the difficulties of enforcing it have not been overcome. The difficulties arise from the fact that the manufacture of paint containing lead compounds is not abolished; such paints can still be used in the coachbuilding trade; meanwhile, inspectors cannot adequately control the use of such paints in private houses and other places. Clearly, if France intends to abolish the use of lead in paints employed on buildings, the law will have to be materially strengthened. No other country has yet proceeded so far. Regulations more or less stringent have been tried in Austria and in Germany, but they have failed to abolish the evil. The movement in Belgium, where regulations have also been tried, is discussed by Mr. Cantineau at some length, and the successful result of abolishing the use of lead paints on the State railways is quoted. The case with regard to Great Britain, where up to the present no action has been taken, is presented by relating the findings of the committees appointed to consider the matter; indeed, throughout this book the evidence presented to, and the conclusions arrived at, by these important committees are frequently quoted at length.

The remedy recommended is considered in the last part of the book. Here the conclusions of the author, who is an engineer, are of particular value. He maintains that substitutes such as zinc white and lithopone have been proved the equal, if not superiors, of white lead; and that supposed difficulties in their use are entirely imaginary. He shows, by quoting market prices, that both these materials to-day cost less than white lead. The sources of supply are looked into and declared to be adequate, so that increased demand should not inflate prices, but rather by calling more manufacturers into the field, tend to lower them. "If to-day white lead were suppressed," he asserts that "our houses would be painted as well as they are now and that we should not suffer in any way; and that very probably, after a period of 20 years, we should almost have forgotten the very existence of white lead."

## PEDUNCULATED PERITONEAL TUBERCULOSIS.

THERE is a rare type of peritoneal tuberculosis, pathologically identical with that commonly found in cattle and known as Perlsucht, which is characterised by the formation of caseous or calcareous masses, surrounded by a fibrous capsule. In cattle these masses occasionally reach a considerable size and may become pedunculated by dragging on the underlying connective tissue. In a recent paper Dr. Henry M. Ray[1] reports a case of this condition in man in the belief that only two such cases have previously been recorded in medical literature, the first by Bizzozero in 1867, and the second by McCallum in 1901. Dr. Ray's case is that of a Polish labourer of 25, admitted to hospital with a five years' history of constipation, anorexia, and severe intermittent colicky pains, his later symptoms being a hacking cough, pain in the chest and abdomen, general weakness, and loss of weight. On admission the patient was acutely ill, the abdomen tender and rigid, and the ankles œdematous, auscultation showing numerous moist râles all over the chest. Thirty-six hours after admission he died, the post-mortem disclosing a mass consisting of a diffusely thickened and fused peritoneum and omentum, closely adherent to the recti muscles and fusing with the capsules of liver and spleen. The intestines were found to be thickly covered with subserous pedunculated firm nodules, varying in size from a pea to a large hazel-nut, with pedicles averaging 3 or 4 mm. reflected on to the nodules and merging into the serous coat of the intestine. The cortex of the kidneys contained multiple tubercles of the size of a pin's head, the cut surfaces of spleen and lungs being peppered with small nodules. Microscopical sections of nodules from the intestines showed typical tuberculous granulation tissue, with a distinct demarcation between the tuberculous process in the nodule and the underlying structure of the intestine. The parietal peritoneum also showed tuberculous granulation tissue with large areas of caseation, while perfectly typical tubercles with areas of caseous necrosis were found in lungs, liver, spleen, and kidneys. Although virulence tests were not carried out with emulsions prepared from the nodules owing to the fact that the tuberculous nature of the lesions was not suspected until the hardened specimens were subjected to routine histological examination, Dr. Ray suggests that the type of lesion found in his case and in the two described by Bizzozero and McCallum can best be explained on the basis of a specific reaction of the host to an infection with a tubercle bacillus, probably of bovine type, of a low degree of virulence. If this view of the pathology of the condition be correct, the nodules may perhaps be looked upon as representing the intestinal equivalent of the multiple benign so-called "sarcoid growths" of the skin, or nodular cutaneous tuberculomata, described by Darier and others.

[1] American Journal of the Medical Sciences, August, 1921.

## ON THE MEASUREMENT OF RESULTS.

THE prudent rate-payer likes to see the goods delivered. For this and other reasons the fall in the general death-rate has been claimed by many different workers in the field of public health as evidence of their particular activity, and a salutary warning in this respect was given by Sir Arthur Newsholme in one of his American addresses.[1] He was himself once taken to task by Prof. Karl Pearson for associating as cause and effect the fall in the phthisis death-rate and the decrease in pauperism; Prof. Pearson alleged a similar correlation between cancer death-rate and expenditure per head on apples. Sir Arthur Newsholme rightly deprecated the quantitative assignment of credit for a given effort in public health work, when the circumstances leading to the desired result were multiform and complex. A recent issue of the monthly bulletins published by the Metropolitan Life Insurance Company of New York supplies an illustration of the need for such precaution. This company has, with perhaps one or two exceptions, a larger number of insured persons on its lists belonging to the wage-earning classes than any other society. Its work is carried out in a manner which is worthy of great praise. Not only is its experience carefully collated and the results from month to month and year to year made the subject of careful study by its extremely competent statistician, Dr. Louis Dublin, but the occasion is taken in each monthly bulletin issued to members and to the general public to give scientific information and instruction of high value on health matters. Not only this, but the company have issued leaflets and pamphlets on various health problems, prepared by experts on their respective subjects, and they have furthermore established an elaborate and almost nation-wide service of nurses, who are prepared, without cost to insured persons, to undertake nursing when acute illness occurs in the insured, and who also perform many of the functions of English health visitors in this country. The work thus briefly

[1] THE LANCET, Oct. 15th, p. 833.

indicated is of high value, and illustrates how, under enlightened management, insurance against disease may be made the means of curtailing the duration of illness and in many instances of preventing its occurrence. That this work is nationally important is self-evident; and we hope that the example thus shown will be widely followed.

In the September *Statistical Bulletin* it is stated that in 1910 the Metropolitan Insurance Company put into operation its measures of health propaganda, which were gradually extended, and now embrace over 13 million men, women, and children of the wage-earning population who are policy-holders; and it is added that at the end of ten years the death-rate has been reduced by more than one-fifth. Stated in added duration of life as measured by life-tables, this means a clear gain of nearly four years for every insured white male at age 10. The improvement in life prospects shown by these striking figures is remarkable, and there can be no reasonable doubt that the efforts made by the insurance company to protect and instruct insured persons have contributed materially to the result. It may be doubted, however, whether the effect of these efforts can be accurately measured, or whether they have borne a predominant part in securing the increased duration of life which has been experienced. In forming a final judgment on this point, it would be necessary to compare the life-table experience of the insured with that of the general population for the same period, to ascertain whether any change likely to affect results had taken place in the racial constitution of the insured, and to what extent sanitary and social amelioration had been shared by insured and non-insured. But although these considerations need to be weighed when an attempt is made to measure exactly the results of educational and nursing work, the value of the work itself is beyond doubt; and our judgment of its value must rest not solely on the imperfect indications furnished by such statistics as are forthcoming. In Sir Arthur Newsholme's words it is safer to rest our inferences and our administrative action, as guardians of the public health, on a careful balance of all available evidence, giving chief place to exact physiological and pathological evidence.

## OVARIAN GRAFTING.

A COMMUNICATION by Prof. Th. Tuffier to the French Academy of Medicine on this subject, which was annotated in these columns last week, provides material for further thought. It is now generally conceded that the degree of menopausal reaction—that is to say, the severity of the symptoms accompanying the cessation of the periods—depends mainly upon individual factors, and in all cases of removal of the ovaries some portion of ovarian tissue should be conserved to ward off as far as possible the unpleasant symptoms which may attend the artificial menopause produced by complete removal of both ovaries. It is probably not true that in all such cases the artificial menopause is likely to be associated with more severe symptoms than those occurring naturally, nor does their severity appear to depend upon the age of the individual at the time the ovaries are removed. It was at one time imagined that the unpleasant results were due to some effect upon the nervous system, but that they are really due to the withdrawal of the ovarian secretion or hormone is now fully recognised. In order to prevent or to ameliorate the symptoms attending the complete removal of both ovaries, attempts have been made to transplant a portion of the ovary of the individual to some other part of the body—autotransplantation; or if a portion of the patient's own ovary is not available, a part of the ovary of another person is used—homotransplantation; and where this is impossible ovarian tissue has been transplanted from an animal of another species—heterotransplantation.

The results so far obtained have been very disappointing in most cases; the grafts either fail to take and quickly die, or if they survive for the time being they do not delay the onset of the menopause nor do they alleviate the symptoms. In a few cases, however, success seems to have been attained. Thus, in a case recorded by R. T. Morris,[1] in a young woman of 21 years of age both ovaries were completely removed by the angiotribe and two grafts from the ovaries of another woman were implantated in the posterior layer of either broad ligament; four months after the operation the patient menstruated again, and four years later she was delivered of a healthy child. In the discussion upon the case which took place, the interesting question was raised as to who was really the mother of the child. Tuffier, who has written largely on this subject, found a homograft to be of no effect, and further found that if an autograft—that is to say, a portion of the patient's own ovary—did not take, it usually disappeared in from six months to two years. In any case, his observations confirm those of other observers—namely, that after a period of some one to two years the transplantated portion of ovarian tissue appears to undergo a precocious senescence. The fact that homografts and heterografts are usually failures would seem to lead to the conclusion that there is some unknown antagonism between the tissues even of the same species as well as between the tissues of different species, and until this is in some way overcome success is very improbable. As a rule, the graft is implanted into the subcutaneous tissues, the subperitoneal tissue, or, as in some of Tuffier's cases, into the mammary gland. It would seem rather a dangerous practice to implant a portion of foreign tissue such as an ovarian graft into so active a gland as the mamma—a gland which is so peculiarly liable to the development of chronic inflammatory changes and malignant disease, and it will be interesting to see whether this site for a graft stands the test of time. Tuffier has obtained very striking results, and there can be no doubt that in all cases where it is found necessary to remove totally the ovaries in a young woman an attempt should be made to practise transplantation preferably with an autograft.

## BACTERIOLOGY OF A SMALL FRENCH EPIDEMIC OF INFLUENZA.

A RECRUDESCENCE of epidemic influenza occurred in the Department of the Nord during the late spring of the present year and the *Revue d'Hygiène et de Police Sanitaire* for September contains an article by Breton and Grysez, from the Pasteur Institute of Lille, dealing with small epidemic foci in schools and barracks. In the case of the latter, it was the younger persons who were especially attacked, 80 per cent. of the cases coming from the 1921 class. The incidence rate was low, being only 1·85 per cent. in a total strength of 12,798 men. The clinical course of the disease was typical, the duration being on an average 5–8 days, and the chief complication broncho-penumonia; the temperature chart frequently showed a fall, after the first febrile period, succeeded by a second rise which was not attributable to any complication. The disease was benign in type, only one death being observed, due to a double broncho-pneumonia. The writers contend that influenza is a clinical rather than a bacteriological entity, and that a variety of organisms may, at different times, be responsible for this syndrome. They base their opinion upon the different results which have been reported as to the presence or absence of Pfeiffer's bacillus in different epidemics. In the present series of cases they failed to find this bacillus either in films of sputum or in cultures. The predominating organism was a diplococcus or short streptococcus, the characters of which were considered by the authors to bring it within the enterococcus group. Blood cultures were negative. From complement-fixation experiments and the result of precipitation tests, which were positive, the authors finally concluded that this organism was of ætiological significance. In criticism of this view it may be remarked that, while the possibility of more than one infection producing

[1] Medical Record, New York, May 5th, 1906.

the clinical picture of influenza has every right to serious consideration at the present stage of our knowledge of the disease, it should constantly be borne in mind that the conditions essential for the isolation of Pfeiffer's bacillus are very precise, and that even in the 1918–19 epidemic some observers failed to find this organism, although its prevalence was a well-established fact. The organism found by the authors of the present paper would appear to be one of the streptococci so commonly noted in the pulmonary complications of influenza. Its characters do not completely correspond to those of the enterococcus of the fæces, although the possibility that this organism may become somewhat modified by a period of parasitism may well be granted.

## DIPLOMAS IN OPHTHALMOLOGY.

ATTENTION is called in our news columns to the additional qualification in ophthalmology open to those who have obtained the F.R.C.S. Eng. Apart from this new distinction, there are already two diplomas in ophthalmology obtainable in England by examination. The first was instituted by the University of Oxford in 1910, the second by the Royal Colleges of Physicians and Surgeons in 1920, in response, as we are reminded in the current number of the *British Journal of Ophthalmology*, to a representation from the Ministry of Health, which desired to be able to select suitable medical practitioners to carry out ophthalmic work. For both diplomas candidates must be registered medical practitioners who have put in a year's attendance at a recognised ophthalmic clinic. For the Oxford diploma a term's attendance at a course of instruction at Oxford is essential. The London examination is divided into two parts, each being held twice a year, the first dealing with anatomy, embryology, physiology, and elementary optics, the second with ophthalmic medicine, surgery, and pathology. That the institution of this diploma meets a want is shown by the fact that for Part I. of the examination there were in July, 1920, 25 candidates, in January, 1921, 34, and in July, 1921, 31. For Part II. the corresponding figures were 11, 9, and 25. Of the 90 candidates who, so far, have presented themselves for Part I. 27 were referred; of the 45 who presented themselves for Part II. 6 were referred. As the *Journal* remarks, an indirect benefit to ophthalmology arising out of the establishment of the diploma has been the stimulus it has given to the study of the preliminary scientific subjects upon which the practice of ophthalmology ought always to be based. Special courses on these subjects are now being held at the Royal London Ophthalmic Hospital (Moorfields), at the Royal Westminster, and at the Central London Ophthalmic Hospitals.

## FACTORS AFFECTING THE CONDITION OF THE TEETH IN CHILDREN.

THE Galton Laboratory for National Eugenics has issued a memoir (No. 7) by Mr. E. C. Rhodes on the Relationship of Condition of the Teeth in Children to Factors of Health and Home Environment. The memoir owes its inception to a report of a county school medical officer for 1912, and is an exhaustive statistical analysis of the dental records made in school medical inspections by the school medical officers of the county in question. The association of a number of factors with dental caries was examined and the personal equation of the medical officers who furnished the data received careful consideration. The author concludes that the data available as the result of inspections by school medical officers are inadequate for any useful statistical purposes, mainly on account of the lack of proper standardisation without which reliable comparisons cannot be made. It is, of course, realised that these data were not originally collected with a view to statistical treatment; if satisfactory statistical results are to be obtained standardised data collected under proper control would be necessary.

From the data actually examined, which form the subject of the memoir, it would appear that the degrees of association between the state of caries in the teeth of children of ages 12 to 14 years and their general health and home environment, are very slight, being roughly about 0·1 in the scale of the correlation coefficient where the range is from 0 to 1, zero being equivalent to absolute independence and 1 being equivalent to perfect association, between the two characters. This is an extremely small degree of correlation when compared with other relationships such as exist in the case of many physical characters between parent and child for which the numerical value is commonly 0·5. It would be of interest to ascertain whether any association exists between the state of the parents' teeth and those of the children, and if such an examination gave a result of the same order as those obtained for other physical characters—i.e., about 0·5—it would be a strong indication that the average bad teeth in a child are due more to bad teeth in the stock than to ill attention during growth. In connexion with this problem a certain amount of material has already been collected and it is hoped to pursue this part of the inquiry when further reliable data have been obtained. It is probable that much valuable information could be derived from the statistical examination of standardised data collected under proper control, and this aspect of the subject is one which will doubtless receive attention from the recently appointed Committee for Investigating the Causes of Dental Decay.

## INCIDENCE OF HEREDITARY SYPHILIS.

Dr. P. C. Jeans[1] and Dr. J. V. Cooke have made a study of the incidence of hereditary syphilis in St. Louis, based on an examination of the placenta combined with the Wassermann reaction in the cord blood in a series of 2030 infants, an almost equal number of whom belonged to the poor and to the well-to-do classes. Examination of the blood of 389 infants after two months of age showed that the proportion of cases of hereditary syphilis that could be diagnosed with certainty from placental examination alone was 27 per cent., while from the Wassermann reaction on the cord 63·6 per cent. of the cases could be recognised. The incidence of hereditary syphilis as determined by the combination of those methods was 15 per cent. in the coloured race, 1·8 per cent. in the poor of the white race, and less than 1 per cent. in the well-to-do classes. On applying these figures to the entire population of St. Louis, which according to the census of 1920 numbered 772,897, the writers estimate that the incidence of hereditary syphilis in that city was 3 per cent., of which the coloured population though numbering 69,854, or only 9 per cent. of the total, contributed approximately half the cases.

## CHRONIC AURAL SUPPURATION.

IT is becoming increasingly recognised that the great prevalence of chronic middle-ear suppuration is accountable for an enormous amount of inefficiency among the population. This was, of course, particularly noticeable during the war, and Dr. J. K. Milne Dickie has some interesting observations to make on the subject in an article which appears in the current number of the *Journal of Laryngology and Otology*, entitled "Experiences of An Otologist in France, 1915–1919." He says that the wastage from this cause was enormous; numbers of soldiers running into thousands were constantly going from hospital to convalescent camp and back to hospital again, it might be for months at a time, receiving little or no treatment, and performing no useful work. He considers that it would have been much wiser to have discharged many of these men and to have put them to munition making, or even to have returned

[1] American Journal of Diseases of Children, October, 1921.

them to civil employment, where they would be self-supporting and not an additional burden on the public purse. We agree with Dr. Dickie in his regret that oto-laryngology was not officially recognised in the British army as a specialty during the war. It was not until the later stages of the war that special centres for ear cases were created and put in charge of recognised otologists, and then only after great insistence by the various consultants to the armies, equipment and organisation remaining highly inadequate. Neurological and eye cases could be referred to special hospitals at the base or in England, where expert service was available. Serious ear cases, on the other hand, were often sent to some small country hospital where they received no treatment by specialists. This should not happen again, and in order to secure an efficient organisation for the future a scheme should be worked out now, so that in war any patient requiring special treatment should be able to obtain it.

But, now that the war is over, the problem of chronic aural suppuration among the civil population is insistent. It is generally agreed that the large majority of cases of suppurative otitis recover completely if treated from the onset; the great cause of chronic otorrhœa, therefore, is neglect of the early acute stage, and the chief hope of improvement lies in the education of all concerned—parents, school-teachers, and medical practitioners.

## EXPERIMENTS ON DOGS IN THE U.S.A.

A PAMPHLET printed in the Government Printing Office at Washington for the use of the Committee of the Judiciary contains a report of a section of the evidence before a subcommittee of that body given by Dr. W. R. Hadwen on the subject of experiments on animals. The subcommittee has been inquiring with regard to a Bill before the Senate, known shortly as S. 758, to prohibit experiments upon living dogs in the district of Columbia or in any of the territorial or insular possessions of the United States, and providing a penalty for violation thereof. The subcommittee consisted of two members only, Senator S. M. Shortridge, chairman, and Senator H. F. Ashurst. Senator Myers, the introducer of the Bill, being present at the inquiry, which appears to have been open to the public. Since apart from Dr. Hadwen's testimony the pamphlet contains only a number of letters from American medical men, deans of medical schools and the like, it is not evident whether any members of the medical profession from Great Britain are likely to lay views divergent from his before the subcommittee, but it should be said at once that Dr. Hadwen made no claim to represent his profession, or to give the views of British physicians or surgeons on the value of experiments on dogs or other animals. He described himself as president of the "British Union for the Abolition of Vivisection, which he believed to be the largest society of the kind in the world," and he frankly admitted that he had "eaten neither fish, flesh, fowl, nor good red herring for 40 years past," when questioned on his views as to the justifiability of killing animals for food.

Those familiar with Dr. Hadwen's expressed opinions will find nothing very novel in his version of them laid before the subcommittee. There is a familiar ring about a statement that "there is no Act of Parliament that a person cannot drive a team of horses through," or "I have no faith in and no sympathy with a government inspector whose whole vested interest lies in the practice of vivisection." This related, of course, to restrictions imposed in England. In criticising experiments attributed to American physiologists he travelled outside his country, and the subcommittee asked some pertinent questions as to the application of experiments upon animals to conditions peculiar to the United States. They were particularly inquisitive with regard to Dr. Hadwen's opinions on the desirability of experimenting on animals for the relief of the sufferings of animals. As to this Dr. Hadwen submitted that it should be sufficient to experiment on an animal when suffering in the ordinary course of things, not to seek a cure by infecting a healthy animal. His questioners referred especially to the bites of rattlesnakes and skunks, and as to the former, Senator Ashurst closed the discussion by saying, "Doctor, you live in England where there are no rattlesnakes, except in museums. I am not surprised at your answer; and I am not surprised that your friends applauded, because you know nothing about rattlesnakes." The incisiveness of some of Senator Ashurst's observations and the pertinent nature of his interrogations of the witness were evidently the result of professional experience. He observed with regard to the value of experiments on animals: "I am not a physician; I am a jack-leg lawyer, who knows when you are experimenting you would better experiment upon the pine than upon your mahogany. In this case I liken the pine to the dog and the mahogany to the human being." On the whole it appears unlikely that Dr. Hadwen has converted the American legislature to his views.

## RETIREMENT OF SIR PHILIP MAGNUS, M.P.

WE understand that Sir Philip Magnus has decided not to offer himself for re-election as Parliamentary representative of the University of London. His letter of intended resignation has been received by the Unionist Association, but the opportunity thus given for the prompt selection of a candidate of this party should be equally convenient to those of other political thinking. Sir Philip Magnus has represented the University of London for upwards of 16 years, and has never forgotten that he was sitting for a constituency which has the largest percentage of medical voters in the Kingdom. He has been, throughout his period of service in the legislature, a consistent friend of what he believed to be the best interests of medicine, and his farewell letter to his political organisation includes a suggestion that is of universal application. He states that in the selection of a candidate to represent the University of London in Parliament regard should be had not only to his party views, "but also to his wide educational experience and to his detailed acquaintance with the requirements of members of the medical and teaching professions." All our readers know that to-day the interests of the medical profession require insistent attention in the House of Commons, and, having regard to the strength of the medical vote, it seems reasonable to suppose that Sir Philip Magnus, who has acted for so many years as a medical man for legislative purposes, will be succeeded by a Member of Parliament who is a qualified practitioner.

## PERMEABILITY IN PHYSIOLOGY AND PATHOLOGY.

SOME five months ago an appreciative audience assembled under the auspices of the University of London to welcome Prof. H. J. Hamburger at the Royal Society of Medicine, and to hear him lecture on this subject. The address was of great intrinsic interest and was delivered in fluent and scholarly English; for Prof. Hamburger, like so many of his countrymen, speaks our tongue well, and his impromptu remarks were as apt as the more formal parts of his address. Further interest attached to the fact that Prof. Hamburger has himself taken such a large share in forming our modern theories on this subject of permeability. For a large part of his active life has been devoted to the study of this and allied subjects; his work began at a time when many of his hearers' parents were as yet unacquainted with one another, and when many of the remainder were yet at school; it is still in progress. We publish in this issue an almost verbatim copy of the address, which will be of especial interest to those who for various reasons were not able to hear his lecture.

The subject of permeability is of the greatest significance from both the theoretical and practica

standpoints. Theoretically, because no problems of physiology, pharmacology, or pathology can afford to ignore it; practically because of its intimate contact with therapeutic problems. As examples of the former we may quote the theories of excitation and inhibition, conduction, fatigue, secretion and excretion, lymph formation and absorption, neutrality regulation, and many others; of the latter the fact that the problem of the treatment of spirochætal and trypanosome disorders is largely one of finding a means of successfully reaching the organisms by a curative agent after they have taken refuge inside the cells. Practical questions in connexion with sugar tolerance are also mentioned in the address. In the early days Prof. Hamburger did not find it at all easy to convince other investigators of the importance of permeability problems. It is different now. We want now to know more about them. The prominent place now given to the ionic interchange between corpuscles and plasma, known to many British physiologists as "the Hamburger interchange" or secondary buffering, in the regulation of the neutrality of the blood, is an example of the general acceptance of the far-reaching importance of cell permeability.

## THE TOBACCO HABIT.

IN the evening lecture on Nov. 9th inaugurating the winter session of the Pharmaceutical Society of Great Britain, Prof. W. E. Dixon dealt with the subject of Drug Habits, beginning with the nearly universal habit of tobacco smoking. He gave a comparative analysis of the smoke from tobacco and opium burned under conditions similar to those which occur in smoking. The first column is the product of 100 g. of tobacco burned as cigarettes, the second of 100 g. of dross opium containing 7·35 per cent. of morphine.

| Percentage product. | Cigarette smoke. | Opium pipe. |
|---|---|---|
| HCN | 0·080 | 0·010 |
| Pyridine | 0·146 | 0·147 |
| Nicotine | 1·165 | — |
| $NH_3$ | 0·360 | 0·395 |
| CO | 410 c.cm. | 0 |
| Morphine | — | 0·016* |

* Chandoo opium smoke contains 0·1 per cent.

Prof. Dixon continued:—

"Ordinary Virginian tobacco, from which cigarettes are made, contains, weight for weight, nearly twice as much nicotine as Manilla cigar tobacco. But when these two are burnt during smoking, the smoke from the cigar contains more than twice the amount of nicotine than that from the cigarette. During the slow combustion of a cigar, as in ordinary smoking, immediately behind the lit end is an area in which the water and other volatile substances in the tobacco condense; during the act of smoking a large portion of the nicotine at the seat of combustion is destroyed (50 per cent.), and the nicotine which finds its way into the mouth of the smoker is derived from the hot gases passing through this hot moist area in which the rest of the nicotine has condensed. The smaller the moist area behind the point of combustion the less likely is the smoke to contain volatile toxic bodies. A thin cigar or a cigarette will yield fewer of these products than a thick cigar, for the thin cigar or cigarette obviously permits a relatively greater cooling.

"The nicotine from the smoke of one cigar should correspond with the nicotine from that of 12 to 18 cigarettes. In practice it seems as if even less nicotine than this reached the circulation unless the cigarette is smoked to the very end. Experiments made (by Prof. Dixon) some years ago on boys showed that the Manilla cigar caused a considerable rise in blood pressure in five or six minutes, followed by collapse, representing respectively the stimulation and depression of nicotine on nerve-cells. No such effect could be obtained with cigarettes. The blood of cigarette inhalers, however, contains carbonic oxide, perhaps 5 per cent. for a man who smokes 20 cigarettes a day, and the vertigo, tremors, nausea, anæmia, and loss of memory for recent events are all symptoms which occur in chronic CO-poisoning. The cigar-smoker, on the contrary, absorbs a considerable amount of nicotine, and true nicotine poisoning may follow from excess.

"Some tolerance can be acquired to both nicotine and CO. Nicotine tolerance is brought about by destruction of the alkaloid in the body of the addict: since the alkaloid reaches the circulation slowly and in minute quantities the tissues are able to deal with it. CO-tolerance is known in animals, and is due to an increase in the number of red blood-cells and percentage of hæmoglobin."

Prof. Dixon attributed the pleasure of smoking partly to the stimulating and later narcotic properties of nicotine, though there are other factors like rhythm and sight to consider. Sir Arthur Pearson's experience regarding smoking by the blind (see p. 1088) has some bearing on this point. The influence of habit is rarely very strong, as most of the nicotine is destroyed during combustion. A smoker seldom forms a very strong craving and can usually stop or modify his addiction by the exercise of some little self-control; but were he to inject his nicotine the tale might be different.

## POST-GRADUATE ACTIVITY IN LONDON.

THE Fellowship of Medicine and Post-Graduate Medical Association, with the coöperation of various special hospitals, is arranging to hold a series of special courses in general and special subjects during the forthcoming year, and the first of these, a six weeks' post-graduate course in General Medicine, will be held from Jan. 9th to Feb. 18th, 1922. The course will consist of a morning and an afternoon session, and the ground covered will include Pulmonary Affections, Heart Disease, Disease of the Nervous System, Fevers, Lunacy, &c., and the programme will be so arranged as to entail a minimum amount of travelling each day. The numbers attending the course will be limited, and early application for further particulars as to syllabus, fees, &c., should be made to the Secretary to the Fellowship, 1, Wimpole-street, W. 1.

OWING to pressure of space we have been compelled to hold over our Parliamentary Report till next week.

Dr. Gustave Monod will lecture on Syphilis of the Stomach at the Royal Society of Medicine on Wednesday, Nov. 23rd, at 5 P.M. Specimens will be shown, and it is hoped that the following, among others, will take part in the discussion: Dr. A. F. Hurst, Dr. J. W. McNee, Mr. Herbert Paterson, and Mr. A. J. Walton.

ACCORDING to statistical returns, which have been at the disposal of the Lettish Information Bureau (24, Gledhow-gardens, London, S.W.), there are 614 doctors in Latvia—that is, one doctor to every 2813 inhabitants. The following table will show how Latvia is situated in comparison with other countries.

| | | | |
|---|---|---|---|
| Lithuania | 180 doctors | i.e., one doctor to every | 10,000 people. |
| Esthonia | 382 ,, | | 3,077 ,, |
| Finland | 1185 ,, | | 2,814 ,, |
| Sweden | — | | 3,656 ,, |
| Poland | — | | 5,750 ,, |
| England | — | | 1,000 ,, |

LITERARY INTELLIGENCE.—Messrs. Baillière, Tindall and Cox announce the publication of the following books by Mr. G. Mayall, M.R.C.V.S.: Sheep and Goats; Cows, Cowhouses, and Milk (second edition); and Pigs, Pigsties, and Pork (second edition).

INFANT MORTALITY IN ABERDEEN.—At the distribution of attendance certificates in the Castlegate Mother and Child Welfare Centre on Oct. 31st, Dr. J. A. Stephen, the city M.O. for mother and child welfare, gave some important statistics regarding infantile mortality in Aberdeen. During the year 1920 there occurred in Aberdeen 170 stillbirths and many premature births, 133 children so born dying soon after birth; while of the 611 children who died before reaching the age of 1 year, about 120, or one-fifth, died during the first week of life. In addition, 38 mothers lost their lives within the first month after confinement. A large proportion of these deaths was preventable, and he appealed to the married women of Aberdeen to take the opportunity of learning what every woman ought to know. Dr. Matthew Hay said that in Aberdeen there were between 1200 and 1300 marriages every year, and 1000 women could easily attend the lectures. This year only 200 women were attending the courses.

# NOTIFICATION OF TUBERCULOSIS, COMPARED WITH THE REPORTED DEATHS FROM THIS DISEASE.

BY G. LISSANT COX, M.D. CAMB.,
CENTRAL TUBERCULOSIS OFFICER, COUNTY OF LANCASTER.

AT the present time considerable attention is being drawn to the unknown infective cases of tuberculosis which exist in all areas. It is generally agreed that the "known" consumptive is a much less dangerous person than the unknown, and also that, during the later stages of tuberculosis of the lungs, the largest number of the infective agent—the tubercle bacilli—is set free, so that each advanced case is more dangerous as a source of infection than an early one. If, therefore, as is the case at present, persons suffering from pulmonary tuberculosis are never notified, and die from the disease; and if, as is also often the case, notification is only made in the last stages of the disease, the attempts to combat the disease can only be partial and incomplete.

In the administrative county of Lancaster during the five years 1916–20 a very careful scrutiny has been made of all deaths from tuberculosis not notified under the Tuberculosis Regulations, and further, during a part of 1920 and 1921, a special inquiry was made into the reasons for non-notification in 163 consecutive cases. A summary of the results of this inquiry is given later in this article.

The total number of deaths from tuberculosis in the year ended Dec. 31st, 1920, and during the four preceding years, of persons *not notified* is given in Table I.

TABLE I.—*Deaths from Tuberculosis of Cases not Notified.*

| | Pulmonary. | Non-pulmonary. | Total. |
|---|---|---|---|
| 1920 .. .. .. | 177 ..... | 122 ..... | 299 |
| 1919 .. .. .. | 221 ..... | 104 ..... | 325 |
| 1918 .. .. .. | 303 ..... | 137 ..... | 440 |
| 1917 .. .. .. | 256 ..... | 141 ..... | 397 |
| 1916 .. .. .. | 270 ..... | 147 ..... | 417 |

The particulars of each death from tuberculosis have been carefully scrutinised in the public health department, so that, as far as possible, all deaths that do not properly belong to the administrative county have been excluded from these figures. Further, by arrangement, local registrars of deaths forward details of all deaths from tuberculosis, and these have been compared with the case notifications, enabling the particulars following to be obtained.

Three objects are served by a notification of a case of tuberculosis. First, the local public health authority is made aware of what may be, or will be, a case of infectious disease, and through the information received, will be in a position to deal with the same. Second, the person comes under the county special organisation dealing with the disease, and can then receive the advice and assistance of the tuberculosis officer, and such treatment as may be recommended will be given under the county scheme. Third, the examination of "contacts" is made possible, whereby early or other cases are discovered and may receive appropriate treatment. The 1920 figures are analysed in Table II.

As the total deaths in the administrative county in 1920 from pulmonary tuberculosis numbered 1323, the 177 *non-notified* fatal cases amounted to 13 per cent., as compared with 16 per cent. last year, 18 per cent. in 1918, and 16 per cent. in each of the years 1917 and 1916. It is satisfactory to note a decline in 1920 in the number of these non-notified fatal cases in the aggregate and in the percentage to the total pulmonary deaths.

There were also 375 deaths recorded in 1920 of persons notified as suffering from pulmonary tuberculosis which took place within three months of the date of notification.

TABLE II.—*Deaths from Tuberculosis in 1920 of Cases not Previously Notified.*

| — | Cause of death. Pulmonary. Primary. | Pulmonary. Secondary. | Non-pulmonary. | Total. |
|---|---|---|---|---|
| Deaths of persons with private addresses .. .. | 130 | 13 | 108 | 251 |
| Deaths of persons belonging to county area— | | | | |
| In county asylums .. .. | 15 | — | 2 | 17 |
| In workhouses | 11 | — | 4 | 15 |
| In other public institutions.. | 7 | 1 | 8 | 16 |
| — | 163 | 14 | 122 | 299 |
| | 177 | | | |

*Special Inquiry into 105 Deaths from Tuberculosis of Cases not Previously Notified.*

As under the Public Health (Tuberculosis) Regulations, 1912, a medical practitioner is required to notify every case of tuberculosis to the local medical officer of health within 48 hours of diagnosis, it is important to ascertain the circumstances under which notification comes to be omitted. A period was taken extending from Oct. 11th, 1920, to June 30th, 1921, and during this time 163 of such deaths were recorded—80 pulmonary and 83 non-pulmonary. Of this number 58 occurred in public institutions, leaving for inquiry 105 deaths—45 pulmonary and 60 non-pulmonary. The result of the inquiries into the reasons for the non-notification of these 105 cases is shown in the following table:—

TABLE III.—*Circumstances of Non-Notification of Fatal Cases.*

| — | Cause of death. Pulmonary. | Non-pulmonary. | Total deaths. |
|---|---|---|---|
| Doctor in attendance shortly before death— | | | |
| 1 week or less .. .. .. | 3 | 8 | 24 |
| 1 to 2 weeks .. .. .. | 2 | 8 | |
| 2 to 3 weeks .. .. .. | — | 3 | |
| Misinterpretation of Tuberculosis Regulations and notification believed unnecessary— | | | |
| Cases previously notified in another area .. .. .. | 5 | 1 | 16 |
| Disease of long duration prior to compulsory notification.. | 1 | — | |
| Temporary resident .. .. | — | 1 | |
| Cases known to tuberculosis officers* .. .. .. | 7 | 1 | |
| Attended by more than one doctor and notification believed to have been made by first practitioner.. | 9 | 8 | 17 |
| Complicated cases presenting difficulty in diagnosis .. .. | 6 | 19 | 25 |
| Accidental omission to notify .. | 5 | 7 | 12 |
| No apparent reason for non-notification .. .. .. | 4 | 4 | 8 |
| Information not ascertained† .. | 3 | — | 3 |
| — | 45 | 60 | 105 |

* Considerable doubt as to diagnosis in some of these cases.
† No reply received to inquiries.

*Summary and Conclusions.*

1. Amongst an estimated population of 1,730,929 in the administrative county of Lancaster, the number of deaths from tuberculosis in 1920 was 1719—pulmonary 1323, non-pulmonary 396.

2. The notifications of pulmonary tuberculosis numbered 2084, and non-pulmonary tuberculosis 968. About 70 per cent. of all new cases in 1920 were examined by the county tuberculosis officers *prior to notification*, these patients being sent for an opinion as to diagnosis and treatment.

3. The deaths from pulmonary tuberculosis not notified were, in 1920, 177, and non-pulmonary 122.

The deaths from pulmonary tuberculosis within three months of notification were 357.

4. A special inquiry into 163 consecutive deaths not notified under the Regulations has shown: (*a*) That a large proportion (58) occurred in public institutions; (*b*) that many of the non-pulmonary cases were those of meningitis or specially complicated cases; (*c*) that in the 45 pulmonary cases, 22 (practically half) were not notified owing to a misunderstanding of the Tuberculosis Regulations, or to a belief that the case had already been notified. The Regulations direct in Article V. that a practitioner "shall not notify a case . . . if he has reasonable grounds for believing that the case has already been notified . . . to the medical officer of health for the district within which the place of residence of the person is situate"; and with the continuance of this clause—which at the most presents a rather unsatisfactory qualification as to notification—misunderstandings are almost certain to arise. No doubt the clause was inserted in an endeavour to avoid duplicate notifications in the same sanitary district, but in view of the liability of error, it would appear much more satisfactory to eliminate the qualification quoted above from the Regulations.

## MEDICINE AND THE LAW.

### *The Definition of Live Birth.*

AT the opening meeting of the Sheffield Medico-Chirurgical Society on Oct. 13th Dr. Godfrey Carter delivered the presidential address, taking as his subject an analysis of his last 100 post-mortem examinations. One of the topics dealt with in the address was the definition of live birth as laid down in courts of law when a mother is tried for the murder of her newly-born child. The point criticised was the necessity of proof that every portion of the child had been extruded when the act causing the death was performed, independently of whether breathing, movements, or other sign of life had occurred. The opinion of those present was that the birth should be treated as a live birth where, in other respects than that of complete delivery, the live birth of a full-term child has taken place, and where there is only evidence of an act of violence to which death can be attributed. A suggestion was made that an Act of Parliament should provide that "a child delivered at full-term and found upon medical examination to be healthy and free from any ascertainable cause of natural death, should be deemed to have been born alive, failing proof to the contrary." This, of course, would take part of the onus of proof from any prosecution for murder, and would lay it upon the accused person, and in other respects could not be carried out by the authority of any judge or judges. The principle of making the prosecution prove the case against the prisoner is too firmly established in our criminal law for it to be likely that Parliament would sanction departure from it in such a case. Apart from this, however, the test of complete extrusion from the mother might be considered and dealt with. If this test were abolished, and the result advocated by the Sheffield Medico-Chirurgical Society were attained, it would follow that many women and girls who are now convicted of concealment of birth would be convicted of murder or manslaughter. This, in short, is what was desired at the meeting referred to. To medical men who have examined the bodies of infants killed in the usual circumstances of such cases, it is clear, as a rule, when one of those felonies has been committed. It equally appears to them that such destruction of life ought to be punished severely and that punishment might check a certain wastage of human life, a result desirable in the interest of the nation. On the other hand, a verdict of murder entails the passing of the death sentence, and it is undesirable that this should be otherwise. A death sentence, however, in the case of nine out of ten of the mothers whose case is under consideration would never be carried out and would be a futile formality. A verdict of manslaughter would impose almost necessarily on the judge the obligation to pass a severe sentence. Either of these verdicts and their consequences would be contrary to public feeling, and would tend to rouse even more sympathy for the criminal than is now exhibited, whenever such trials take place. Moreover, the jury must find a prisoner guilty before sentence is passed, and modern experience agrees with that of bygone generations that where the sentence entailed is heavier than public opinion approves, juries refuse to convict. In these circumstances, whatever may be the strictly logical inference to be drawn from the conditions provable by medical men in the cases referred to it, it appears unlikely that the law will be altered, or that if altered, very different verdicts from those "merciful verdicts" now returned would ensue. The points suggested should always be weighed in connexion with this subject.

### *Action for Damages against a Medical Man.*

A case of considerable importance to general practitioners has just been decided at the Suffolk County Assizes, where a patient brought an action for negligence against Dr. H. G. Wood-Hill, a well-known medical man of Beccles, and obtained heavy damages. The patient, while driving a dog-cart was thrown out and sustained an injury to her right leg. Dr. Wood-Hill was sent for and diagnosed a fracture of the upper third of the femur. He treated her by a Thomas splint and extension, and had her removed to the Beccles Hospital, where she was also examined by his partner, Dr. G. R. Fox, who agreed both as to the diagnosis and treatment, and did not consider that an anæsthetic was advisable. No radiograph was taken, and it came out that the X ray apparatus at the Beccles Hospital was out of order. The splint was removed and the weight taken away about five weeks after the accident, and Dr. Wood-Hill stated that he then found union to have taken place with only half an inch of shortening. He warned the patient against putting any weight on the leg for some time, and allowed her to go home to Hertfordshire about a fortnight later. Ten days after her return home she suddenly felt her leg give way. Dr. Cooper, her family doctor, was called in and he stated in his evidence that he found the right leg one and three-quarter inches shorter than the other, with pain, swelling of the buttock, and inability to raise the leg. He diagnosed the fracture to be in the neck of the femur, and advised an X ray examination, which confirmed his opinion. The patient was subsequently removed to the Freemasons' Hospital in London, where an operation was performed.

There was a marked divergence of opinion among the surgeons examined. While Dr. Cooper stated that the fracture was in the neck of the femur, and gave it as his opinion that an anæsthetic should have been employed at first, Sir Hamilton Ballance said that he thought an anæsthetic was not indicated, as any struggling would have increased the damage round the fracture. He believed that a re-fracture of the bone had occurred, owing to the patient putting too much weight on it, and expressed himself as satisfied with Dr. Wood-Hill's treatment. Mr. Hugh Ernest Griffiths and Mr. Harold William Wilson, assistant surgeons at St. Bartholomew's Hospital, confirmed Sir Hamilton Ballance's opinion.

The verdict of the jury was largely influenced by Dr. Wood-Hill's omission to have an X ray photograph taken of the injury, and the lesson of the case is that in such positions this aid to diagnosis should not be omitted.

UNIVERSITY OF MANCHESTER.—Mr. Stanley Wyatt, M.Sc., investigator to the Industrial Fatigue Research Board, has been appointed Special Lecturer in Psychology; Dr. D. E. Core, Lecturer in Neurology; Dr. A. E. Barclay, Lecturer in Radiology; and Mr. H. H. Rayner, Lecturer in the Surgical Diseases of Children. The following awards have been made: Leech Fellowships in Medicine, Dr. F. R. Ferguson and Dr. Eugenia R. A. Cooper. Graduate Scholarship in Medicine, Dr. G. V. Ashcroft; Tom Jones Memorial Surgical Scholarship, A. H. Southam.

## VIENNA.

(FROM OUR OWN CORRESPONDENT.)

*Reappearance of Influenza.*

ACCORDING to the October reports of the Board of Health a new wave of influenza threatens the city. Hitherto cases have been few and the course of the disease is mild, with a prevalence of intestinal symptoms, but with the recent sudden change of weather catarrhal manifestations appeared; cerebral cases have also been reported and practitioners have been warned. This time the younger part of the population is more affected, perhaps because older people have been immunised by almost universal epidemics during recent years.

*The Rat Plague.*

For some months the difficulties of everyday life in Vienna have been complicated by the appearance of swarms of rats and mice, apparently imported in consignments of wheat and grain from abroad. The considerable trade carried on with the Balkan States, and Eastern Europe generally, gives rise to danger of diseases communicable by these animals, and stringent precautions have been taken to avert disaster. Sanitary authorities have been instructed to pay special attention to the conditions of drains and sewers. It may be mentioned that the spread of influenza has also been attributed by some investigators to the spread of mice and rats.

*The Problem of Doctors' Fees.*

Owing to constant depreciation of the currency the medical profession is faced by a serious and hitherto unsolved problem. In a very instructive leaflet, published by the Medical Organisation, it is pointed out that the daily wages of carpenters, bricklayers, engineers, and shoemakers have increased from 100 to 120 times as compared with 1913, whilst their daily working hours have been cut down to eight. A number of other workers earn between 70 and 90 times their pre-war wages, whilst the prices of food and other necessaries have risen 120 to 200 times. These people can therefore obtain from 50 to 90 per cent. of the commodities they were accustomed to buy before the war. Doctors' fees, however, have not increased *pari passu*, and only quite lately have the public been asked to pay as much as 50 times the pre-war fee for medical attention. The Medical Organisation has now demanded a hundredfold increase of the original fees, and also stipulates that foreign patients shall be charged fees in their native currency. An English, Swiss, or Dutch patient charged 1000 kronen for each visit from a doctor would still only pay a fraction of the fees to which he is accustomed at home—1000 kronen being at present worth about two-thirds of a Dutch florin, 1¼ Swiss francs, or about 1*s.* 3*d.* But medical fees are considerably higher in their own countries, and such patients are expected to pay accordingly. For the country practitioners in Austria conditions are quite different; their payments are mostly made in "kind." For a consultation at the doctor's office the charge is 5 kilos of grain, or a kilo of meat, or half a kilo of butter or lard, or the equivalent in money. This arrangement satisfies both parties, as the conditions of peasant life are not much altered, but it is, of course, inapplicable to the towns. Panel doctors, and those holding appointments under private corporations, have also demanded an adjustment of salaries to meet the new monetary conditions. The result of all such increases is, however, only transitory; a man now earning 100,000 kronen a month is fairly well paid, but that is really equivalent to no more than a monthly salary of six or seven pounds sterling.

*Statistical Data of Vienna Medical Students.*

During the last university term 3228 ordinary students (including 450 women) and 127 extraordinary students appeared on the register of the medical faculty, being 35 per cent. of the total number of students at the university. For the present semester the number of first-year students to be admitted is fixed at 400. Last term very many nationalities were represented; the youngest students registered were 17½ years of age, and the number of ordinary students above 30 was 17. Students usually obtain their diploma of M.D. at the age of 25 or 26; over 600 qualified during the past semester. Foreign students can obtain diplomas only if they bind themselves not to practise in this country, but otherwise they are eligible to all house appointments or vacancies as internes and second assistants. About 28 per cent. of students were regular users of the cheap meal kitchen, chiefly supported by grants from the Anglo-American Relief Mission and the Red Cross Society.

*Synchronous Combined Treatment of Metrorrhagia by Radium and X Rays.*

At a recent meeting of the Vienna Gynæcological Society, Prof. Weibel reported the results of treatment of hæmorrhagic conditions of the uterus, including myomatous hæmorrhage, by a single (castrating) X ray dose, combined with radium application. The patient's abdomen is exposed for three to four hours to X rays, with a 3 mm. platinum or aluminium filter; meanwhile a quantity of 40–50 mg. radium is inserted into the posterior fornix vaginæ and left therein—well filtered—for 36 to 40 hours. Of the 160 cases so treated, amenorrhœa was at once induced in 33, 35 had only one more hæmorrhage, 47 ceased to menstruate after two months, and 8 after three or four months; the remainder had oligomenorrhœa, and 6 were altogether refractory. In younger patients oligomenorrhœa is produced by a dose which in older women is followed by amenorrhœa. As the latter often has disagreeable sequelæ (e.g., castration) it is advisable to aim at reducing the bleeding rather than causing it to disappear. A radium injury was only once noted—an extensive necrosis in the posterior fornix in a case of a patient with pernicious anæmia. In a series of 1510 women exposed for the same purpose to X rays during the years 1911–19, only 17 again became pregnant, with 24 fœtuses. Thirteen full-term children were born, and in nine cases abortion took place; the living children seemed to suffer no ill-effects from X ray treatment of the mother.

Nov. 3rd.

## KING EDWARD'S HOSPITAL FUND FOR LONDON.

A SPECIAL meeting of the President and General Council of King Edward's Hospital Fund for London was held at St. James's Palace on Nov. 9th, when the EARL OF DONOUGHMORE, member of the President's Power Committee, presided. He read a letter from the Prince of Wales, in which his Royal Highness pointed out that under the Hospitals Commission the King's Fund had been constituted the central authority for London, and that this would involve certain duties which could only be properly carried out by reconstructing the committees of the Fund.

Lord STUART OF WORTLEY, the Chairman of the King's Fund Policy Committee, in presenting a report of that committee on the question of the reorganisation of the King's Fund, said that the proposals would involve no change in the Act of Incorporation. A resolution approving of the need for certain changes having been adopted, he presented a report of the Executive Committee on the conditions attached to Government grants to voluntary hospitals. This included the following resolutions:—

(1) That the President and General Council of King Edward's Hospital Fund for London have considered the conditions attached by the Treasury to the temporary assistance voted by Parliament to voluntary hospitals requiring that fresh money shall be raised pound for pound with the Government grants, and are of opinion that the application of this condition, which was not recommended in the report of Lord Cave's Committee, nor separately considered (much less expressly enjoined) by Parliament, will lead to great difficulties and probably to great

injustices as between different hospitals in the distribution of the grants; and they trust, therefore, that the condition will not be pressed.

(2) That copies of this resolution should be forwarded to the Prime Minister, the Chancellor of the Exchequer, and the Minister of Health, and the Voluntary Hospitals Commission.

These resolutions having been seconded by Sir ARTHUR STANLEY and supported by Mr. HOPKINSON, were, after discussion, put and carried.

The meeting closed with the usual votes of thanks.

# Public Health Services.

## REPORTS OF MEDICAL OFFICERS OF HEALTH.

### CITY OF LEEDS.

Dr. J. J. Jervis tells us that the year has been one of progress in every direction, as the vital statistics and other records embodied in the report show. The population was estimated by the Registrar-General at 448,913 for death-rate and 449,410 for birth-rate. The most important figures were as follows: Birth-rate, 25·01; death-rate, 14·68; infant mortality rate, 110; death-rate from pulmonary tuberculosis, 1·23; and from other forms of tuberculosis, 0·33. The death-rate from diarrhœa and enteritis under two years per 1000 births was 12·47. The figure of 8·3 represents the death-rate for England and Wales, and the table given on p. 16 shows that Leeds does not come out well in comparison with the 10 large English cities. Dr. Jervis has much to say on the smoke problem, pointing out that respiratory diseases as a group (including phthisis and influenza) were responsible for 31·3 per cent. of the total deaths. He believes that "prevention can only be achieved by tackling the smoke nuisance resolutely and compelling manufacturers to adopt cleaner and more rational methods of extracting heat from coal fuel and at the same time by extending the system of central heating for domestic purposes." Dr. Jervis shows that infant mortality from respiratory diseases was highest in those wards in which the atmospheric pollution is most marked, and suggests that where plant life fails to exist, it is impossible for the delicate human organism to escape some damage. From the paragraphs on smoke inspection we gather that the limit adopted is three minutes of dense smoke in the hour, and that although in 544 cases this limit was exceeded there were no prosecutions. We trust that public opinion will support the health committee of Leeds if it acts on Dr. Jervis's advice and institutes a really vigorous campaign.

Dr. Jervis wants more hospital accommodation for pneumonia, and suggests that some of the beds in the Poor-law infirmaries should be used to supplement the deficiency of the general hospitals in this respect. The pooling of the hospital accommodation of the Poor-law and sanitary authorities for the general interests of the community would appear to be a possible solution of many problems now confronting medical officers of health. Dr. Jervis does not believe in the grading of milk; he contends that those who suffer most from the drinking of impure milk are the working classes, many of whom are finding it hard enough even now to purchase sufficient milk and could not afford the higher price demanded for graded milk. Dr. Jervis reports that the quality of cattle arriving in Leeds for slaughter has shown a marked improvement since control was removed. He would like to see the closing of the private slaughter-houses and the provision of adequate accommodation at the public abattoir.

Seven beds are reserved at the Maternity Hospital for mothers and babies in case of ophthalmia neonatorum. Of 141 cases of this disease notified, five made an imperfect recovery, eight died, two were still under treatment, and six were lost sight of owing to removal. The work done by the V.D. clinics has increased; 2697 new cases of syphilis and gonorrhœa attended, 829 patients discontinued treatment before being pronounced cured, of which a very large proportion were still capable of transmitting the disease to others. "There is urgent need," continues Dr. Jervis, "for Parliamentary powers to compel infected individuals to continue treatment until cure is effected." The death-rate from pulmonary tuberculosis in Leeds showed an increase during the war years and has now again reached pre-war levels. The Ministry of Health have withheld approval of a scheme for the dental treatment of the tuberculous on the score of expense, and the provision of a new sanatorium at Moortown with beds for 320 cases has been postponed for the same reason. The corporation have taken over the two tuberculosis hospitals (Armley House and Gateforth) belonging to the Voluntary Tuberculosis Association. There is a comprehensive scheme for maternity and child welfare. The ante-natal work is growing, but, as elsewhere, the reduction in infant mortality does not extend to the neo-natal mortality. The deaths from puerperal fever have risen from six in 1919 to 29 in 1920. Dr. Jervis emphasises the need for the establishment of small maternity homes in the congested working-class areas.

Dr. Jervis is strongly in favour of public health propaganda by sanitary authorities and says that in Leeds this policy has been adopted with the best results. The housing problem is rendered specially difficult in Leeds by the large number of back-to-back houses. Of the total 113,310 houses in the city, 34,904 are "through" houses and 78,406 are back-to-back. Dr. Jervis divides the back-to-back houses into three groups. The first or oldest group, numbering 35,100, built in long unbroken rows, "is frankly bad and unhealthy, and must be got rid of as soon as practicable." The second group, numbering 29,082, and built in blocks of eight, "is better, but requires drastic improvement to bring it up to standard." The third group, the erection of which was approved up to 1909, numbers 14,224, and "consists of a good type of house which, while not quite up to the standard of the modern through house, does not fall very far short of it." Apart from the question of the back-to-back houses, there is an estimated shortage of 5800 houses owing to house-building being in abeyance during the war. The progress of the housing schemes has been very slow—only 309 have been completed; but there are now some signs of speeding up and it is hoped about 1000 will be completed before the end of the current year. A strenuous effort is being made to overtake the arrears of sanitary work and repairs left by the war.

# The Services.

## ROYAL ARMY MEDICAL CORPS.

Lt. (temp. Capt.) E. H. W. Elkington to be Capt.

### TERRITORIAL ARMY.

Lt.-Col. F. W. Gibbon, having attained the age limit, is retired and retains the rank of Lt.-Col., with permission to wear the prescribed uniform.

Maj. J. O. Summerhayes resigns his commn. and is granted the rank of Lt.-Col., with permission to wear the prescribed uniform.

Capt. J. J. E. Biggs to be Maj.

Capt. W. A. Jackman (late R.A.M.C., Spec. Res.) to be Capt.

1st N. Gen. Hosp.—Maj. D. W. Patterson, having attained the age limit, is retired, and is granted the rank of Lt.-Col.

### TERRITORIAL ARMY RESERVE.

Lt.-Col. J. B. Jamieson, from General List, to be Lt.-Col.

Maj. M. A. Archdale, having attained the age limit, is retired and retains the rank of Maj.

WESTMINSTER HOSPITAL.—A dance in aid of this hospital and medical school will be held at King Edward VII. Rooms, Hotel Victoria, Northumberland-avenue, London, W.C., on Friday, Dec. 2nd. Tickets (£1 1s.) may be obtained from the hon. secs., Mr. A. D. Hepburn and Mr. J. Wilson, at the hospital.

# Correspondence.

"Audi alteram partem."

## GENERALIA ON THE LOUSE PROBLEM ON THE WESTERN FRONT.

*To the Editor of* THE LANCET.

SIR,—I trust you will allow me, even at this late date, an opportunity of apologising to you and Dr. M. Coplans for an apparent lack of courtesy in not replying to Dr. Coplans's letter in your issue of April 30th. After my article of March 26th I watched for comment, but by mischance never saw the issue of April 30th and not till a short time ago was my attention called to it. I therefore take the earliest opportunity of sending this rejoinder.

I regret that the renewal of my acquaintance with Dr. Coplans begins in an atmosphere of misunderstanding—hardly controversy—as my former association with him in France was so pleasant, and I trust this letter will clear the air a little. Firstly, I fear I must hold to my own opinion as to the relative value of my manner of collecting data on lousiness compared with the official method cited by Dr. Coplans. I can conceive of no better way than mine—i.e., by doing the job personally and thoroughly from the front line backwards; living it, not reading it. Certain of my previous writings on the louse problem had such a curious war history that Dr. Coplans may be unaware of their existence, and perhaps I ought to have made it plainer that my "Generalia" should be read as complementary to them. Dr. Coplans will find that I dealt with many of his points in these writings, which concern the results of disinfestation work in England during June to September, 1917, after I had been recalled home for a commission from the Second Army, of which Dr. Coplans was D.A.D.M.S.(San.). The results of this work, carried on in collaboration with Captain J. T. Grant, R.A.M.C., and Mr. Bacot, which involved experiments with hot-air disinfestors—both of my own design and those of others—steam disinfestors, and the Clayton apparatus, were forwarded to the War Office in the form of reports. These, as well as those of others, with our consent were placed by the War Office in the hands of Prof. Nuttall, who was, and is, monographing the louse, in order to complete his presentation of "Combating Lousiness among Soldiers and Civilians,"[1] and also to secure their early publication and distribution. In this publication the reports are summarised or quoted and Prof. Nuttall makes all due acknowledgments. Here Dr. Coplans will find the detailed data on the relative capacities, &c., of various disinfestors upon which I base my individual judgment of their relative values. Here, also, are summarised the reports of Captain Gair, R.A.M.C., and Mr. Bacot, and that of Captain Grant, Mr. Bacot, and myself on the Clayton apparatus. He will also see that my work was essentially of a practical wholesale nature, carried on under service conditions, and this being so, I take strong exception to his inapposite remark "experimental work on disinfestation carried out under laboratory conditions may be highly successful given certain desiderata . . . ."

For reasons which I shall presently discover I confess to having deliberately ignored the Clayton apparatus in my article. It would have been better for me to have dismissed it with a few words. Dr. Coplans's opinion, "no type of disinfestor approaches the efficiency of the Clayton machine in dealing with verminous dwellings and their contents in situ," is like "the flowers that bloom in the spring" because I look at the question of the *disinfestation of lousy soldiers during a campaign*. If reference be made to "Combating lousiness, &c.," it will be noted that our experiments prove conclusively (to my mind) that in expense and general efficiency it is not to be placed, as a louse disinfestor under campaigning conditions, in the same category as the other types I mention in my article; I know that I am not alone in this opinion. I am open to correction, but I believe that the Clayton plants were bought before convincing tests showed their serious limitations in the field. Anyone who has personally wrestled wholeheartedly with the plant as an expert mechanic and I did on many a day, will understand why, far from having "no interest in the Clayton apparatus except its utility" (Dr. Coplans), I have, in fact, rather less. To prevent misunderstanding I express no opinion of the value of the plant as a house and ship disinfestor.

Concerning my report in the winter of 1916–17 on hot-air disinfestation, which Dr. Coplans quotes, it should be explained that my experiments never got beyond the preliminary; I was only beginning to discover the underlying principles. The work was then interrupted by my being detailed for experimental work at the new Laiterie disinfestor at Poperinghe. This was succeeded by six weeks' trench fever in hospital and then by experimentation with chemically impregnated clothing at the request of the War Office. About this same winter Captain R. Orr, C.A.M.C., in England, had been able to solve much of the problem.[1] I admit my judgment of 1916–17 was somewhat premature on certain points, but the seriously impairing effect of wet and muddy garments upon hot-air disinfestors still remains a fact. The modification of my views I owe largely to the work of Captain Orr.

I am afraid I cannot deal with certain passages of Dr. Coplans's letter, except by the following somewhat long personal statement.

*Entomological Work during the War.*

*As a N.C.O.*

| | | |
|---|---|---|
| 1. | July – Sept., 1915 | Work and lectures on flies and mosquitoes. |
| 2. | Sept., 1915– Feb., 1916 | Initial research on louse problem. |
| 3. | Mar.–Sept. .. | Work on disinfestors and divisional bath routine. |
| 4. | Oct.–Nov. .. | Investigation as to possible connexion of louse with Weil's disease; study of louse mouth-parts. |
| 5. | Dec., 1916 – Mar., 1917 | Initial work on hot-air disinfestation; lectures at Second Army school of sanitation for officers; work at Laiterie disinfestor; six weeks trench fever; experiments with impregnated clothing at War Office request (party and I segregated). |

*As an Officer.*

| | | |
|---|---|---|
| 6. | May–Sept. .. | Experiments in England on disinfestation methods. |
| 7. | Oct.–Dec. .. | Trench fever work in England. |
| 8. | Jan.–July, 1918 | Attached to American Red Cross Trench Fever Commission in France. |
| 9. | July–Sept. .. | Investigation of anopheline conditions in Flanders. |
| 10. | Oct., 1918 – Mar., 1919 | Attached No. 20 Gen. Hosp. for trench fever work. |

I cite this in order to prove what little time I really had for instructional work or, to quote Dr. Coplans, "a free hand to conduct the necessary propaganda both at organised schools and elsewhere." I feel sure that Dr. Coplans will be surprised at this résumé. The most useful period of instructional work by lecturing was during the régime of Dr. Coplans when, as D.A.D.M.S. (San.), he gave me the best opportunity I ever had—that of meeting the medical officers of the Second Army. At other times my instructional work consisted mainly of interviews with all ranks interested in the business of disinfestation and in lectures given voluntarily and unofficially to such as cared to listen. Space does not permit me to make more than passing reference to all the provoking and unnecessary interruptions to which my work was subjected. I do not include in this the misfortunes due to campaigning. At the same time I acknowledge gladly the many facilities I did have granted and recall with pleasure the sympathy of the many charming fellows of all ranks whom I met. My "grouse," which is tempered by the cheerful fact that I was on the side that did win the war, is against a system. This by way of showing that I am not lacking in a sense of proportion. My experiences were only those of many a scientist

[1] Parasitology, vol. x.

in khaki who, if they were wise, cultivated in those strenuous times what all Tommies did—a sardonic philosophy and a sense of humour.

Touching the matter of responsibility for the conduct of a louse campaign, I should be sorry indeed if the rank and file of medical and sanitary officers thought I disparaged their feelings and efforts. Perhaps certain of your readers, erstwhile campaigners, may remember that I fought and taught that the regimental and front area medical officers had not the time and opportunity for disinfestation work on the necessary large scale. Neither is it hidden in my writings that such is even beyond an army D.A.D.M.S. (San.), subject as he is to all manner of official limitations. Even more than Dr. Coplans's assistance in those days I acknowledge his appreciation and understanding, but even he himself will admit how little realised, through no fault of one's own, may be the bright ideas of a D.A.D.M.S. So what chance for a louse campaign in the grand manner had a lance-sergeant. I must therefore emphatically decline to be saddled with any responsibility for the conduct of the strategy of the louse campaign. A field-marshal's baton is no good in a lance-sergeant's knapsack.

In conclusion, Dr. Coplans's quotation of Mr. Dan Jenkins, "The Labour Party desires for the working man and his family, at home, the same standard of medical organisation, skill, and care as was shown for the British armies in France, &c.," is somewhat loose. I take it to mean rather a testimony to the nationalisation of medical effort, because no soldier, let alone a member of the Labour Party in khaki, would ever subscribe to the idea that the problem of his war-time lousiness was ever tackled with complete success.

I am, Sir, yours faithfully,

A. D. PEACOCK.

Armstrong College, Newcastle-on-Tyne, Nov. 12th, 1921.

## TRYPANOCIDE.

*To the Editor of* THE LANCET.

SIR,—In August last it fell to my lot as sectional editor of the *Tropical Diseases Bulletin* to write a critical review of recent work on sleeping sickness. For reasons which are clearly stated at the commencement of my review I decided to deal mainly with the work of Marshall and Vassallo. Judging from Dr. E. T. Jensen's letter, published in your issue of Nov. 12th, this review has caused considerable distress to him, and to a recently self-constituted body, the Tropical Diseases Prevention Association, of which he is the hon. secretary.

I may say at once that until I read an annotation in THE LANCET of Sept. 10th—the day on which my critique was forwarded to the Tropical Diseases Bureau for publication—I was ignorant of the fact that Dr. Jensen's Association was acting as sponsor to Marshall and Vassallo. My object in writing the review was simply to present to the readers of the *Bulletin* a critical analysis of the work on which Marshall and Vassallo based their sweeping claims; and as the result of a most careful consideration of their papers I reached the following conclusions:—

1. The work is based on two fundamental assumptions; both of which are incorrect, or at least can only be accepted with very considerable qualification.
2. The treatment is not new, even for trypanosomiasis, but is substantially the same as that tried by Reichenow in 1914, and abandoned by him as useless in that it failed to sterilise the cerebro-spinal fluid.
3. Marshall and Vassallo produce no satisfactory evidence that intrathecal injections of salvarsanised serum sterilise infected cerebro-spinal fluids.
4. The results, so far published, fail to substantiate the claim that the treatment gives better results than any hitherto obtained by other methods.

Scientifically Dr. Jensen's letter is of no value, as he does not attempt (probably because he is unable) to controvert the arguments on which I based these conclusions. He points out that the work done by Marshall and Vassallo was performed by them as Uganda medical officers, and in their spare time. This may account for the unsatisfactory nature of Marshall and Vassallo's observations, but it certainly does not invalidate my conclusions, nor is it likely to inspire belief in Marshall and Vassallo's claims, or respect for the judgment of Dr. Jensen and his Association.

Dr. Jensen, however, is mainly concerned in defending the position of the Tropical Diseases Prevention Association, and in view of the youth of this body it would, naturally, resent anything which might suggest that it had been guilty of a gross error of judgment. Even though willing to make full allowance for his sensitiveness on this point, I cannot refrain from pointing out to Dr. Jensen that he has descended to somewhat questionable tactics. In the first place, he states that I published my critical view "in a medium which precluded the possibility of a reply." This is an unpleasant suggestion, and in view of the publication of his lengthy letters in *The Lancet* and in the *British Medical Journal*, the complaint seems unjustifiable. I do not know whether he has communicated with the editor of the *Tropical Diseases Bulletin*, but although I can well believe that a letter of the kind in question might be refused publication, I do not believe that anything of scientific value would be rejected. In the second place, Dr. Jensen loudly protests that his Association "is not prejudiced in favour of any one method of treatment, but it does consider that fair play should be given to any method which has shown promise of success." Such platitudes may satisfy Dr. Jensen, and certainly they do nobody any harm, but it is rather amusing to read in the next line that one who has had the temerity to differ from the Association on a matter of the value of evidence is accused of lacking a sense of fair play. In fact there is a delicate insinuation that I have purposely belittled Marshall and Vassallo's work in order to promote the interests of a certain German chemical firm.

Dr. Jensen's letter closes with a remarkable homily, which runs as follows: "It is, perhaps, not fully recognised by tropical experts working at home that treatment of such a disease as sleeping sickness must be administratively and economically practicable on a large scale as well as scientifically effective in a hospital at home." Possibly this is the case, but how it touches the question at issue is obscure, unless it is intended to have a personal application. If so, I can only point out that it comes strangely from the pen of one who, so far as I am aware, has contributed nothing to our knowledge of the disease, and deplore the fact that one who is so little conversant with the literature of the subject should have attempted the task which Dr. Jensen has undertaken.

I am, Sir, yours faithfully,

WARRINGTON YORKE.

Liverpool School of Tropical Medicine, Nov. 14th, 1921.

## BELLADONNA POISONING.

*To the Editor of* THE LANCET.

SIR,—In connexion with the case of belladonna poisoning reported in your last issue by Dr. H. Neville Taylor, the following may be deemed worthy of record. It illustrates (1) recovery after ingestion, by a schoolboy of 15, of 12 gr. of morphia, and 1 gr. of atropine in solution three hours previously; (2) the effect of delayed absorption due to food; (3) the response to remedial measures, especially oxygen under pressure, in an apparently hopeless case.

At 7.20 P.M. on July 21th, 1920, I first saw the patient in the absence of Dr. S. W. Carruthers, of Upper Norwood, who was his family physician. The boy had been found completely unconscious in a deck chair in the garden by his father, a veterinary surgeon; he could not be roused by any of the usual means. His condition was as follows: Pupils widely dilated, not reacting to light; conjunctival and corneal reflexes absent; temp. subnormal, P. 120, respiration stertorous (14 per minute); jaws clenched; knee-jerks increased; plantar reflexes brisk, extensor response; legs spastic, no head retraction or Kernig's sign; lips and ears cyanosed; face flushed, skin dry; lungs, a few rhonchi and bubbling râles; other organs, nothing noteworthy.

In the absence of any history of previous illness, or data bearing on the patient's condition, the stomach was

immediately washed out with several quarts of hot water and solution of potassium permanganate, and more hot water, until the fluid returned clear. A wedge and gag were required to open the mouth. A pint of strong hot coffee was left in the stomach, and 0·50 caffein (Maison Clin ampoules) was injected intramuscularly. This caused a distinct improvement. I next saw him at 11 P.M., with Dr. Carruthers, who injected strychnine gr. 1/20. The boy's condition was then very grave—respirations 4 per minute, shallow and rattling; lips and ears deeply cyanotic, face pale. Pulse 124, running in type.

All the usual methods of reflex stimulation of the respiratory centre having been tried and failed, artificial respiration was started and oxygen administered—with the collaboration of Mr. E. W. Gandy—under pressure in a Clover's inhaler, for periods of a quarter of an hour, until 2 A.M. on the 25th. The effect of the oxygen was remarkable; the capillary venous stasis and cyanosis immediately disappeared, and the pulse improved in tone and rate (from 120 to under 100) at the end of each 15 minutes administration. At 2 A.M. he vomited lumps of undigested meat and vegetables, but no fluid, and by 5 A.M. he had recovered sufficiently under the standard methods of treatment to go for a walk in the garden. No after-effects were observed.

Afterwards, the boy stated that as he was troubled with insomnia—due probably to overwork and worry over some approaching examinations—he had taken the contents (half an ounce) of a bottle of morphia and atropine solution containing 24 gr. of morphia sulphate and 2 gr. of atropine sulphate to the ounce, which he had found in his father's surgery. There was no suggestion of suicidal intent. This was at about 4.45 P.M., some two and a half hours after a heavy mid-day dinner. The stomach washings revealed on analysis 1 gr. of morphia, but no atropine.

I am, Sir, yours faithfully,

J. G. WILLMORE.

Ministry of Pensions Hospital, Orpington, Nov. 12th, 1921.

## THE STATUS OF MEDICAL EDUCATION.

*To the Editor of* THE LANCET.

SIR,—The whole medical profession owes a debt of gratitude to Sir Clifford Allbutt and others who, like him, are earnestly striving to improve the status of medical education in this country. One of the crying needs of the day in our profession is the breaking down of the artificially-created barriers between anatomy, physiology, medicine, and surgery. Fortunately, the type is now rare of professor or lecturer in anatomy or physiology who shuts himself up in his department, wilfully closing his eyes to the fact that his students will be the practitioners of the future, carefully avoiding any reference to the practical importance of the subject he lectures upon, and rarely associating in joint researches with his hospital colleagues. There is still, however, much room for improvement. It is surely a very extraordinary thing that with the example of John Hunter's life and work to point the way, so many of us close our minds to the rich harvest of knowledge which must accrue from the intimate coöperation of all branches of science.

May I be allowed to give an example of the unhappy state of affairs that results from this divorce that has been brought of late very forcibly to my notice. In the course of my researches into joint problems under the ægis of the Medical Research Council and with the kind help and collaboration of Prof. Shattock, I have been astonished at the prevailing lack of accurate knowledge of even the most elementary problems of the anatomy and physiology of the joints; the latter, in particular, may be regarded as a practically unopened book. Take the articular cartilages—our knowledge of their structure and nutrition and of their mode of repair cannot yet be said to be placed upon a firmly established basis. Again, what are the functions and essential microscopic structure of the synovial membranes? No two observers agree upon this point. Do they contain lymphatics and nerves? What is the composition of normal synovial fluid? I am unable to satisfy myself that anyone has ever analysed it, although fluids from pathological joints have been analysed by various observers. What is the effect of rest and movement upon the secretion of synovial fluid? Many other still unsolved problems might be quoted. Joint affections are extremely common in the community, yet we cannot hope to treat them rationally unless our treatment is based upon a sound knowledge of physiology and anatomy. Turning next to the large variety of conditions grouped together under the name "arthritis deformans" or "rheumatoid arthritis," we find that everything, including nomenclature, pathology, diagnosis, and treatment, is in a condition of chaos. There is a loss of public confidence in the profession in this matter which is, unfortunately, quite justified; many of the thinking and more highly educated members of the public are amazed that we are neglectful of these vital problems, and that we should rest content with an almost mediæval superstition and ignorance when in the realms of physics and chemistry and other sciences such marvellous discoveries have been made. Of writing of books upon arthritis there is no end; but most of them consist very largely of theory, and the most significant fact about all of them is that they contain no word about the normal physiology or intrinsic anatomy of the joint. We often rail at the unprofessional bone-setter, forgetting that, as Sir Arthur Keith has pointed out, the most powerful weapon in his armamentarium is our own ignorance of anatomy and physiology.

What is the remedy for this state of affairs? First, there must be the active coöperation to which we have already alluded. Secondly, the teaching of anatomy and physiology should be profoundly modified. Sir Clifford Allbutt holds that the time given to these preliminary subjects should not be cut down or diminished; I believe that Sir Charters Symonds argues that anatomy and physiology should be pruned and unimportant details of no practical significance omitted, the actual time devoted to these subjects being also shortened. This argument Sir Clifford Allbutt calls "utilitarianism." This is neither the place nor time to enter into an argument upon the pros and cons of "utilitarianism," but my impression is that the word has something to do with usefulness or utility (surely nothing derogatory in that). Is there not room for a course to be set midway between the views of these two distinguished men? Surely anatomy and physiology should be taught not as pure sciences but as applied sciences. Why? Because the average student is not learning these subjects in order some day to occupy a professorial chair, but to make himself more efficient in the alleviation of human suffering. The argument in favour of preliminary subjects such as anatomy being taught as pure sciences seems to be that they act as a "peculiar discipline" and "develop close observation and accuracy in a unique manner." It might well be asked, "Is it fair, to the public and to the budding doctor himself, when there is so much to be learnt in a short period to devote so much time and labour to details which are of no practical use to him in his after career, if the mental training can be equally well given in a way that does not diminish his power as a scientific and thinking physician or surgeon, and at the same time makes him a better handicraftsman?

How can this object be achieved without cutting down the time given to preliminary subjects? First, at least one weekly demonstration in anatomy and one in physiology should be held in the wards or out-patient departments of the hospital. It is almost impossible to exaggerate the interest and enthusiasm this procedure would arouse in the student's mind. Let us imagine, for example, that the lymphatics of the breast had been a subject of demonstration in the anatomical department. Let the class next see and examine in the hospital a case of cancer of the breast with lymphatic gland involvement. Let each examine the tumour and note its size, shape, consistency, &c. The dry anatomical facts will be infused with life, and the mind admirably prepared for the more serious clinical work to follow. Who will deny that the student's powers of close observation and accuracy will thus be increased far more than

if, for example, he had carefully dissected the relationships and connexions of the otic ganglion or the origin and insertion of the various individual elements of the erector spinæ muscle. There will, of course, be minor difficulties to be overcome—such as, for example, those connected with the arrangement and selection of the clinical cases—arrangements would be necessary between the demonstrators of anatomy, physiology, and the surgical and medical registrars—a most welcome and healthy fusion of ideas and research work would follow almost as a matter of course. The second manner in which this object may be achieved lies with the teacher of anatomy and physiology himself. It is desirable, if possible, that the teacher of anatomy should hold the Fellowship of the College of Surgeons or other high surgical degree or diploma, and should conscientiously keep himself in touch with modern advances in surgery and pathology. In the same way it is eminently desirable (and this fortunately is often the case) that the teacher of physiology should have distinguished himself in medicine, and should likewise have kept in touch with the progress of medicine.

How few there are who wander round the Hunterian collection at the Royal College of Surgeons—the admiration of the scientific world—who grasp the real message of its serried ranks of silent yet eloquent preparations. John Hunter—his body tortured with suffering, his mind burdened with the cares of one of the largest private practices in London—gave his fortune and every moment of his spare time to the formation of this magnificent collection, because his genius knew that the appeal to the eye is greater than written or spoken word. There is a crying need at the present time for us in our researches humbly to follow in Hunter's footsteps, and to break down the absurd barriers built by narrow-mindedness between the divisions of a science which in reality is one and undivisible.

I am, Sir, yours faithfully,

A. G. TIMBRELL FISHER,
Hunterian Professor of the Royal College of Surgeons of England, 1920–21, 1921–22, &c.

Harley-street, W., Nov. 7th, 1921.

## ADENOIDS AND RICKETS.

*To the Editor of* THE LANCET.

SIR,—In his article in your last issue on the essential causes of adenoids and their association with rickets, Dr. H. Merrall hardly does justice to my exposition of the causation of adenoids in stating that "Cautley, whilst attaching some importance to the vicious circle of adenoids and catarrh, believes bottle-feeding and rickets mostly to blame." It is true that I ascribed to rickets many of the ill-effects which are thought due to adenoids, and that I pointed out the increased frequency of adenoids and rickets since the introduction of bottle-feeding. But I summed up by saying that the prevention of adenoids is mainly concerned with the prevention of rickets and nasal catarrh, guarding the child against exposure to infection, and treating nasal catarrh seriously; and that if you guard a child against infection you will probably guard it against hyperplasia of the adenoid tissue.

Obviously I agree with Dr. Merrall that frequently recurring colds are the chief cause, but I regard rickets as an important concomitant factor, inasmuch as catarrh of the mucous membrane is the most common early sign of this disease. Throughout my introductory remarks the importance of nasal catarrh was strongly emphasised, rickets being regarded as a cause of catarrh. The association of adenoids and deformity of the jaws was insisted on, but did not receive much attention in the subsequent discussion. Almost all children with adenoids are rachitic. Probably the deformity is the result of the association of nasal obstruction with rickets rather than due to either cause acting independently.

I am, Sir, yours faithfully,

Park-street, W., Nov. 12th, 1921. EDMUND CAUTLEY.

## THE ÆTIOLOGY OF ADENOIDS.

*To the Editor of* THE LANCET.

SIR,—In view of the alarming prevalence of "adenoids" in this country it is greatly to be regretted that the pathology of this disease has not yet been definitely settled. In his paper on the subject, published in THE LANCET of Nov. 12th, Dr. H. Merrall emphasises the part played by oft-repeated colds in the ætiology of adenoids. Doubtless he is right here. But this is not the beginning of the story. Why these oft-recurring colds? Are they not the result of the *status catarrhalis*, so ably described by Dr. H. C. Cameron, a condition which is, in large measure at least, the result of improper food? Unfortunately in a large proportion of the medical problems which confront us the data at our disposal do not admit of a logical conclusion; we have to be content with hypotheses: but I venture to suggest that, as regards the ætiology of adenoids, a logical conclusion *can* be arrived at. Thus:—

Adenoid disease is more common among the British than among any other people. Wherever the British settle, be it in Australia, New Zealand, South Africa, or Canada, there adenoid disease is rampant among the British children. This cannot be because the British are hereditarily more liable to adenoid disease than other peoples, since there is evidence that the British of not many generations back did not greatly suffer from this disease. The one material environmental factor common to the British settlers in various parts of the world, but not shared by other peoples, is the food: the British take their dietetic customs with them wherever they go.

*Ergo*, a cause of adenoids is to be sought for in the nature of the British dietary.

If there is a flaw in this argument I should be glad to have it pointed out.

Cease to feed children on an excess of sugar and soft starchy foods and I venture to predict a pronounced diminution in the present disastrous prevalence of adenoids among us.

I am Sir, yours faithfully,

HARRY CAMPBELL.

Wimpole-street, W., Nov. 12th, 1921.

## THE STAFF OF HOLLOWAY HOSPITAL.

*To the Editor of* THE LANCET.

SIR,—It will interest your readers to hear that the Voluntary Nursing Advisory Board for Holloway Gaol went to the Prison Commissioners' Office on Monday, Nov. 7th, and were most kindly received.

After considerable discussion, the following points were agreed on:—The Holloway Hospital is to be staffed entirely by certificated nurses, reasonable time being allowed for the absorption of the existing officers where not certificated. In this way it is hoped that all difficulties may be overcome, and that the matron, with the assistance of a trained and certificated staff, may be in a position to secure the good nursing of the patients confided to her care. The Voluntary Nursing Advisory Board expressed their appreciation of the good services rendered by the unqualified officers who have prison training only, and announced their intention of sending a special message of thanks to one of these, who is likely to be taking up work elsewhere.

I am, Sir, yours faithfully,

MARY SCHARLIEB.

Harley-street, W., Nov. 12th, 1921.

DONATIONS AND BEQUESTS.—The late Mr. John Ward Cousins left property of the gross value of £14,138, of which £12,278 is net personalty. Subject to certain life interests the testator gives, among other bequests, £3000 each to the Portsmouth, Portsea, and Gosport Hospitals; £500 to the Portsmouth and South Hants Eye and Ear Hospital; and £200 each to Dr. Barnardo's Homes, the Shaftesbury Society and Ragged School Union, and the Young Men's Christian Association.

# Obituary.

## SHERIDAN DELÉPINE, B.Sc. LAUSANNE, M.B., C.M. EDIN., M.Sc. MANCH.,

PROFESSOR OF PUBLIC HEALTH AND BACTERIOLOGY AND DIRECTOR OF THE PUBLIC HEALTH LABORATORY, UNIVERSITY OF MANCHESTER.

WE much regret to announce the death of Prof. Delépine, professor of public health and bacteriology in the University of Manchester, which occurred on Sunday last at his home in Withington.

Auguste Sheridan Delépine was 66 years of age at the time of his death. He was the son of a French father and a Swiss mother, and was educated in Paris, Geneva, and Lausanne, graduating in science at the last place with distinction, and while still quite a boy. Thence he proceeded to the University of Edinburgh, where he pursued medical studies, and in 1882 graduated as M.B., C.M. with first-class honours. He was interested from the first in pathological anatomy and in the developments of the then new science of bacteriology, and after acting at Edinburgh as demonstrator in these subjects, came to London and shortly afterwards was appointed demonstrator of pathology and curator to the museum at St. George's Hospital. The St. George's Hospital medical school was at that time a large one, and Delépine did excellent work both in assistance to the clinical routine of the hospital and in the instruction of a long series of pupils, many of whom had ample reason later to be grateful for his painstaking and lucid demonstrations.

Some eight years later—namely, in 1891—he proceeded to Manchester, where he was appointed the first Procter professor of pathology and morbid anatomy. All the arrangements for a new pathological department at Manchester, with a bacteriological laboratory in attachment, were carried out under Delépine's instructions, and when later the connexion between the University Medical School and the Royal Infirmary became the close one that it now is, Delépine, as professor of pathology in the University, became official pathologist to the institution. Our columns and those of the scientific press generally have borne frequent witness to the good work that he did there, and that was done under his ægis by assistants and pupils. His investigations, for example, into the source of tubercle bacilli in cows' milk, into the bearing of the outbreaks of food poisons upon the ætiology of summer diarrhœa, and into the general conditions necessary to obtain a clean milk-supply, form good examples of thoroughly scientific work directed towards practical ends. At the same time Delépine was the originator of two mechanical appliances valuable in physical and bacteriological technique—namely, a gas-sphygmoscope and a convenient modification of the microtome.

After 20 years as professor of pathology, during which time great practical assistance was afforded to the sanitary authorities of Manchester and Salford by the scientific researches carried on in the laboratory, a public health department was instituted in the University of Manchester, and Delépine, having resigned the chair of pathology, was appointed professor of public health and bacteriology and director of the public health laboratory. From this laboratory an admirable series of researches emerged connected with the immediate sanitary needs of Manchester, Salford, and the surrounding districts. At the laboratory Prof. Delépine gave instruction to a large number of graduates intending to take the diploma in public health of the University, and while some of these assisted in conducting research work, others were employed in maintaining the public health of the locality by making careful reports upon the incidence and spread of preventable disease. No more sound course in practical hygiene was given at any medical school than at Manchester under Delépine.

During the war Delépine did good work in an advisory capacity as sanitarian and bacteriologist, and in particular his researches were found extremely pertinent in the treatment of trench foot. A brief article on frost-bite, published in THE LANCET in February, 1915, at the close of the first winter of war, pointed the way to the prevention of a condition that was costing the allied armies many lives, as well as causing enormous inefficiency, pain, and crippling.

Delépine had been in delicate health for some time, and there seems no doubt that his life was shortened by the tragedy that overtook him when he lost his only son in the war. By his friends he will be remembered warmly for his geniality and courtesy, and by all who came into relations with him for his simplicity and firmness.

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## SIR GEORGE JOSEPH HAMILTON EVATT, K.C.B.,

MAJOR-GENERAL A.M.S. (RETD.).

Major-General Evatt who, during his life, played a prominent part in the reform of the medical and nursing services of the army, died in London on Nov. 5th. We have briefly chronicled the event. He was within a few days of his seventy-ninth year at the time of his death.

The son of Captain G. Evatt, he was educated at the Royal College of Surgeons in Ireland, won a gold medal at Trinity College, Dublin, and qualified in 1863 as L.R.C.S.I., and M.D. R.U.I. Three years later he entered the Army Medical Service, being attached to the 25th King's Own Scottish Borderers. He first saw service with the Perak Expedition with Sir H. Ross's Bengal column in 1876, for which he obtained the medal and clasp; he was promoted to Surgeon-Major in the following year. In the Afghan War of 1878-80 he was at the capture of Ali Masjid and was mentioned in despatches, as he was also in the advance on Gundermak, and in the return in the "Death March" of 1879, when he was specially thanked in General Orders by the Viceroy in Council and by the Commander-in-Chief in India. He also commanded a field hospital in the second campaign which included the advance to Cabul under General Sir Charles Gough, the action on the Ghuzui Road, and the return to India. In 1885 he became A Lieut.-Colonel in the R.A.M.C., in which year he served in the Suakin Expedition, including the actions of Handub, Tamai, and the removal of the wounded from MacNeill's zareba, being again mentioned in despatches and receiving for his services the medal and clasp and Khedive's Star. He was also in the Zhob Valley Expedition of 1890 and commanded a field hospital, when he again received mention in official records.

Evatt had now reached the rank of Surgeon-General and from 1880 to 1886 he held the post of medical officer to the Royal Military Academy, Woolwich; from 1887 to 1891 he was senior medical officer at the Quetta Garrison, Baluchistan; from 1892 to 1894 sanitary officer to the Woolwich Garrison; from 1894 to 1896 secretary of the Royal Victoria Hospital, Netley. He again served abroad and for three years was principal medical officer in China, holding a similar office in the Western District of England from 1899 to 1902, after which he became Surgeon-General to the Second Army Corps at Salisbury. In conjunction with Mr. (now Sir James) Cantlie, Evatt organised the Volunteer R.A.M.C. in 1883, and a few years later drew up a scheme for the Army Nursing Service Reserve. He also founded the Medical Officers of Schools Association. An indefatigable worker, he associated himself with many activities which had a bearing upon the health of the nation, and was a member of the committee of the International Health Exhibition of 1884, a vice-president of the British Medical Temperance Association, a member of the Council of the Royal Army Temperance Association, and President of the Poor Law Medical Officers Association. In 1886 he contested unsuccessfully Woolwich as a Liberal, in 1906 the Fareham Division of Hampshire, and in 1910 Brighton. During the war, 1915–16, he was president of the Travelling Medical Board, Western Command. He contributed largely

to medical and military literature, and was the author of "The Medico-Military Topography of the Persian Gulf and Euphrates and Tigris Valley," "The Causes and Cure of Army Drunkenness," "The Death March through the Khyber Pass," and several manuals relating to army medical organisation and service.

One of his fellow officers writes of General Evatt:

"Perhaps his most fruitful work was done in 1881, when he read a paper to the Royal United Service Institution on Army Medical Organisation in War, appealing for militia volunteer bearer companies, for larger staffs of field hospitals, for an army medical corps, officers and men together, for a central military medical school in London, so that military medical officers might be in touch with the leaders of the civil medical profession and hear from them of the advances they were making, for an army medical journal, for proper organisation of the medical corps for war. All these have since come. The more the autonomy of the medical corps is fostered, said Evatt, the more we shall rise to efficiency. I met him first when he was P.M.O. of the army in Hong Kong. In his first year there Kowloon got a good water supply. In his second, the army took over an hotel at the Peak, 1700 feet above the sea, as a convalescent barracks, to give the women, children, and men of the army change in the hot season from the oppressiveness of quarters at the sea level. In his third year the soldier got a third shirt. How, he said, can a man change his sweaty shirt at night unless he has three; one will be at the wash. It is difficult nowadays to realise how different he was from other senior medical officers, how helpful to junior officers who wished to work. Primarily, perhaps, he was a philanthropist, but his education and employment made him seek the benefit of the nation by improvement in the training and position of the medical profession, which owes him gratitude."

Sir George Evatt married in 1877 Sophie Mary Frances, daughter of W. W. Raleigh Kerr. The loss of their only son at Mons clouded the end of his life, otherwise rendered happy by the way in which the Royal Army Medical Corps made good during its great ordeal.

# Medical News.

UNIVERSITY OF CAMBRIDGE.—Dr. G. B. Batten, Dr. I. S. Hirsch, Dr. E. R. Morton, and Dr. C. W. S. Saberton have been approved for the Diploma in Medical Radiology and Electrology.

UNIVERSITY OF OXFORD.—Mr. E. G. T. Liddell, B.M., B.Ch., Trinity College, formerly senior demy of Magdalen College, has been elected to a Fellowship at Trinity College. Mr. M. H. Mackeith, B.M., B.Ch., of Queen's College, has been elected to a Fellowship at Magdalen College, and has been appointed demonstrator in human anatomy. Dr. E. W. Ainley Walker has been elected a member of the General Board of the Faculties, as a representative of the Faculty of Natural Science.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At a meeting of Comitia of the Royal College of Physicians on Oct. 27th, and of the Council of the Royal College of Surgeons on Nov. 10th, diplomas of L.R.C.P. and M.R.C.S. were respectively conferred upon 77 candidates who have passed the Final Examination in Medicine, Surgery, and Midwifery of the Conjoint Board, and have complied with the by-laws. The following are the names (including 20 women) and medical schools of the successful candidates:—

M. T. Ahmed and S. Annecke, Guy's; Helen R. Ashton, London; T. J. D. Atteridge, St. Bart.'s; Mary J. Ayrton, Cambridge and Charing Cross; A. H. Bean, Univ. Coll.; J. H. Blair, Kingston (Ont.); J. G. B. Brass, St. Louis and London; *H. F. Brice-Smith, Cambridge and Middlesex; E. E. L. Burnier, Lausanne; Linda Catmur, London; W. E. R. Coad, Toronto and Univ. Coll.; W. E. Cody, Bombay and St. Bart.'s; Nancy M. Coutts, Royal Free; P. G. Cumming, Manchester; E. C. Curwen, Cambridge and St. Thomas's; P. T. Davidson, Middlesex; Edith M. P. Davies, Royal Free; Muriel A. M. Davies, St. George's; A. H. Douthwaite, Guy's; H. S. Drabble, Sheffield; C. T. J. N. Drobig, St. Thomas's; H. O. Eksteen, Guy's; A. H. El Ramli, Cairo and Liverpool; E. W. Evans, Birmingham; V. Feldman, Univ. Coll.; L. R. Fifield, London; E. C. H. Foreman, Univ. Coll.; E. Gallop, J. E. Gardner, and C. M. Gwillim, St. Bart.'s; C. B. Hawthorne, Cambridge and Birmingham; Margaret Haywood, Royal Free; Marjorie B. Hubert, St. Mary's; *J. W. Hunt, Toronto and London; E. R. Jagger, Manchester; A. V. Johnson, Cambridge and Birmingham; Eva M. Johnson, Univ. Coll.; David John Jones, Cardiff and Westminster; Dilys Menai Jones, Cardiff and Univ. Coll.; Gladys H. E. H. J. Jones, London; R. O. Jones, Liverpool; E. J. L. Jones-Evans, St. Thomas's; G. Kinneir, St. Bart.'s; F. C. Lewis, Liverpool; W. E. Lloyd, St. Bart.'s; I. B. McCann, Guy's; Elisabeth E. McCulloch, Liverpool; A. Maude, Manchester; E. O. Morrison, Cambridge and St. Mary's; J. B. G. Muir, Middlesex; H. W. L. Nichols, London; F. A. Pickworth, Charing Cross; †Ruth W. Plimsoll, Royal Free and St. Mary's; Enid Mary Powell, Cardiff and Charing Cross; F. W. M. Pratt, Durham and St. George's; J. A. Prichard, Bristol; Philippa P. Pughe, Univ. Coll.; W. G. Roberts, Liverpool; A. T. Rogers and I. Rosenberg, Guy's; J. J. Rowlands, London; A. R. Rutnam, Middlesex; Elaine M. K. Salmond, Royal Free; L. Segal, Charing Cross; A. I. Solberg, Leeds; A. E. Strawbaun, Cape and Guy's; R. O. Swaine, Middlesex; D. R. Thompson, London; Helen C. Tompson, Royal Free; Nellie Vaus, Westminster; C. E. Whitting, Cambridge and St. Thomas's; A. B. Whytock, Kingston; B. W. Williams, St. Thomas's; W. H. Williams, Charing Cross; Beryl Wiseham, Calcutta and London; J. R. Wright, Manchester; and Greta I. Yeoman, St. Mary's.

* Diploma of M.R.C.S. previously conferred.
† Diploma of M.R.C.S. alone conferred.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At an ordinary council meeting, held on Nov. 10th, Sir Anthony Bowlby being in the chair, diplomas of membership were granted to 76 candidates.—Regulations for the F.R.C.S. with Ophthalmology were approved and adopted. The examination, which will be held in June and December, comprises anatomy, physiology, and optics in their relation to ophthalmology; clinical and pathological ophthalmology, and ophthalmic operations. It consists of (*a*) two written papers, (*b*) a written and viva voce examination on patients, (*c*) operations, (*d*) viva voce examination upon pathological and anatomical specimens and upon ophthalmology in general. Candidates must be Fellows or have passed the second professional examination for the diploma of Fellow. They must produce evidence of having held the office of clinical assistant, house surgeon, or registrar for a period of two years at a recognised ophthalmic hospital or in the ophthalmic department of a recognised general hospital. The last-named conditions may be modified in the case of a candidate (*a*) who holds, or has held, the appointment of (assistant) ophthalmic surgeon, (*b*) who has carried out original investigations, (*c*) who has written a thesis or published work, (*d*) whose studies or practice have extended over a prolonged period. The fee for readmission is £10 10*s*. A candidate who passes the examination will receive a certificate entitling him to describe himself as "F.R.C.S. (with Ophthalmology)."—The President reported that he had signed and attached the College seal to the agreement between the War Department and the College relating to the custody by the College of the Army Medical War Collection of pathological, orthopædic, and other specimens.—A letter was read from the clerk to the London County Council calling attention to a scheme for the welfare of blind persons in London and the setting up under the scheme of a central council for the London blind, for advisory and other purposes. Mr. J. Herbert Fisher, F.R.C.S., was appointed as the representative of the College on this central council.—The President reported that the Thomas Vicary lecture on a Glimpse into the History of the Surgery of the Brain would be delivered by Sir Charles Ballance on Thursday, Dec. 8th, at 5 P.M., and that the Bradshaw lecture on the Operative Treatment of Malignant Disease, its Possibilities and Limitations, would be delivered by Mr. H. J. Waring on Wednesday, Dec. 14th, at 5 P.M.

At the Primary Examination in Anatomy and Physiology for the Fellowship, held from Nov. 1st to 11th, 151 candidates presented themselves, of whom 35 per cent. were approved (including four women) and 65 per cent. were referred. The following are the names and medical schools of the successful candidates:—

W. C. Abell, Leeds; N. F. Adeney, Cambridge and St. Mary's; J. C. Ainsworth-Davis, Cambridge and St. Bart.'s; Annie Anderson, Aberdeen and St. Mary's; J. B. Barnett, Birmingham and Middlesex; A. P. Bertwistle, Leeds and St. Mary's; D. P. Bhargave, Lucknow and London; H. C. Brayshaw, Edinburgh and St. Mary's; L. G. Brown, Oxford, London, and Middlesex; W. G. S. Brown, Cambridge; H. Bruce, Leeds; W. K. Connell, Glasgow; J. A. Currie, Guy's; V. W. Dix, Cambridge and London; J. Elgood, St. Bart.'s; F. N. Foster, Leeds; F. P. Fouche, Edinburgh; A. J. Gardham, Univ. Coll. and Middlesex; W. H. George, Cardiff and London; C. S. Gideon and Katharine A. C. Gillie, St. Mary's; J. D. Grierson, Edinburgh; K. W. Heritage, London; E. Holmes, Leeds; G. H. G. Jackson, Cambridge and London; J. A. James and Gwladys R. Llewelyn, Bristol; N. P. L Lumb, St. Thomas's and Middlesex; A. G. Lumsden, Aberdeen; A. C. McAllister, King's Coll., Middlesex, and St. Mary's; J. McCormack, Belfast and St. Mary's; J. R. McDonald, Edinburgh and London; N. Makar, St. Mary's; W. A. Mill, Guy's; C. I. N. Morgan, St. Bart.'s; J. D. R. Murray, Cambridge and Middlesex; J. R. Nicholson-Lailey, Bristol; Constance M. Ottley, Oxford and London; K. O. Parsons, Guy's; A. A. F. Peel, Oxford; R. S. Scott, St. Bart.'s; H. W. Symons, Leeds and London; G. L. Thompson and

F. C. O. Valentine, Cambridge and London; G. T. Verry, St. Bart.'s; A. S. H. Walford, Cambridge and St. Thomas's; A. L. Walker, Cambridge and Middlesex; G. C. Wellish, Sydney and Middlesex; D. R. Wheeler, Belfast and Middlesex; J. G. Whitaker, Melbourne and Middlesex; P. B. Wilkinson, King's Coll.; V. Wilkinson, Cambridge and Middlesex; and A. L. Yates, St. Bart.'s.

UNIVERSITY OF GLASGOW.—The following degrees were conferred on Nov. 12th:—

DOCTORS OF MEDICINE (M.D.).

1. *With Honours.*—Douglas Kinchin Adams, M.A., B.Sc., M.B., Ch.B.; Thomas Jones Mackie, M.B., Ch.B.; Noah Morris, B.Sc., M.B., Ch.B.
2. *With High Commendation.*—William Taylor, M.B., Ch.B.
3. *With Commendation.*—Charles Cameron, M.A., M.B., Ch.B.; Ronald Thomson Grant, M.B., Ch.B.; Robert Cecil Robertson, M.B., Ch.B.; Herbert Watt Torrance, M.B., Ch.B.
4. *Ordinary Degree.*—John Broadfoot, M.B., Ch.B.; Ethel Crawford, M.B., Ch.B.; James Paterson Crawford, M.B., Ch.B.; Andrew Garvie, M.B., Ch.B.; William Hogarth Kerr, M.A., M.B., Ch.B.; Duncan Mackenzie MacRae, M.A., M.B., Ch.B.; George Taylor, M.A., M.B., Ch.B.

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY (M.B., CH.B.).

*With Commendation.*—Andrew Allan Bell.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At the annual meeting of Fellows, held on Nov. 7th, the following office-bearers were elected:—President: Dr. W. G. Dun; Visitor: Dr. W. R. Jack; Treasurer: Mr. George McIntyre; Hon. Librarian: Dr. E. H. L. Oliphant; Councillors: President, Visitor, Treasurer, Hon. Librarian (all ex officio), Dr. James A. Adams, as representative to the General Medical Council (ex officio), Mr. R. M. Buchanan, Dr. Ebenezer Duncan, Mr. Henry Rutherfurd, Dr. A. K. Chalmers, Sir Kennedy Dalziel, and Mr. J. Mason Noble.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND.—At a meeting of the President and Fellows of the Royal College of Physicians of Ireland held on Nov. 4th, Dr. Robert Marshall, of Belfast, and Dr. Victor M. Synge, of Dublin, were sworn in as Fellows of the College, and Dr. Patrick Ley, of Dublin, was admitted a Member.

UNIVERSITY OF SHEFFIELD.—The University Council has made the following appointments:—Dr. W. W. King to the post of Lecturer in Gynæcology, and Mr. G. H. Freggatt, L.D.S. Eng., to the post of Lecturer in Dental Mechanics.

LONDON SCHOOL OF TROPICAL MEDICINE: ANNUAL DINNER.—The annual gathering which took place at the Trocadero Restaurant on Nov. 9th was a good example of the *olia tuta*, which is the motto of the school. Prof. A. Alcock, who presided, made a learned survey of the achievements of tropical medicine and the share taken in them by the London School. Its two chief remaining needs—a chair of biochemistry and a department of tropical hygiene—he hoped would soon be met. Col. R. H. Elliot, in proposing the "Guests," paid admiring tribute to the rival school at Liverpool, and Col. J. J. Pratt's graceful speech did no more than justice to the chairman's own services in the region of medical entomology. The point was usefully brought out that the time has now gone past for expeditionary forces, the hope of the future lying rather in local centres, permanently staffed and equipped but still in close touch with a central school. The dinner was again noteworthy in the support that it received from the present students of the school, many of them drawn from distant parts of the world.

NATIONAL COUNCIL FOR COMBATING VENEREAL DISEASES.—At a meeting of the Council held at the House of the Royal Society of Medicine on Nov. 11th the following resolution was proposed by Mr. E. B. Turner, chairman of the Medical Committee, and seconded by Mr. Kenneth Walker, joint honorary medical secretary.

That the Executive Committee be directed to appoint a Committee of Enquiry with instructions to prepare a full and detailed report on the working of ablution centres and that this report be laid before the Council at its next meeting.

The resolution was carried unanimously, as was the following rider, proposed by Miss Alison Neilans, of the Association for Moral and Social Hygiene, and seconded by Mr. Kent, of the Alliance of Honour:—

The Committee so appointed shall include men and women representatives and shall take into consideration the social and moral effects as well as the medical results of providing and advertising the ablution centres.

A vigorous address was delivered by Lord Gorell, the President of the Council, protesting against the misrepresentations of the work of the Council in certain quarters.

Dr. A. J. Rice-Oxley, J.P., has been elected Mayor of the Royal Borough of Kensington for the third time.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC.—A sum of over £500 was raised in connexion with the bazaar held on Founders' Day, Nov. 2nd.

ROYAL SANITARY INSTITUTE.—The next Congress is being arranged to be held at Bournemouth from July 24th to 29th, 1922.

GLASGOW UNIVERSITY CLUB, LONDON.—The autumn dinner will be held in the Holborn Restaurant, London, on Friday, Nov. 25th, at 7.30 P.M., Prof. J. Millar Thomson, F.R.S., presiding.

19TH C.C.S. ANNUAL DINNER.—The third annual dinner will take place in London on Friday, Nov. 25th. Tickets and further particulars may be obtained from the Dinner Secretary, Rev. E. C. Doddrell, 6, Alexandra House, Regent's Park-road, Finchley, London, N. 3.

MIDDLESEX HOSPITAL MEDICAL SCHOOL.—An emeritus lecture will be delivered on Feb. 7th, 1922, at 3 P.M., by Sir John Bland-Sutton, the subject of the lecture being the Choroid Plexuses of the Brain and Psammoma.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SOCIETY.—The annual dinner of the Society will be held at the Restaurant Frascati on Monday, Dec. 12th, at 7.15 for 7.30 P.M. Tickets, price 10s., may be obtained from the hon. sec. or the resident medical officer at the hospital.

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.—The annual general meeting of the Association will be held at 11, Chandos-street, London, W., on Tuesday, Nov. 29th, at 5 P.M., when the President, Mr. R. C. Elmslie, will deliver an address on the Status of Physical Instructors in Schools, to be followed by discussion.

CLASSES FOR STAMMERERS.—The Board of Education has decided that the classes for stammering children shall in future be regarded as "arrangements for attending to the health and physical condition of children educated in public elementary schools." This has enabled the London County Council, which is at present responsible for six such classes, to regard them as forming part of the school medical service.

MEDICAL WOMEN'S FEDERATION.—The Council of the Federation held its autumn meeting in Edinburgh on Nov. 11th and 12th. Twenty-two members, representing the ten different associations of the Federation in Great Britain, were present. A long discussion took place on the situation raised by the recent dismissal by the Glasgow Corporation of three married medical women, who for some years had been employed in its child welfare and tuberculosis departments. When appointed they were already married; now they were dismissed at the instance of the Labour members of the corporation, who object to the employment of all women whose husbands are earning a regular income. The recent dismissal of Dr. G. Mial'-Smith by the St. Pancras Borough Council, on account of her marriage since her appointment, nothing precluding marriage having been inserted in the terms of her contract, also came under consideration. It was felt strongly by the Council that it is not the function of the State or of any public authority to inquire into the private and economic affairs of men or women who apply for medical appointments. It was agreed that persons should be allowed to hold office because of their individual capability to perform the assigned duties. If inquiries were uniformly pressed, it would mean the exclusion from public service of many men who by inheritance or marriage have sufficient money to maintain a small home. The following resolution was carried unanimously:—

That this Council records its opinion that marriage should be no bar to the holding of posts by medical women, and considers their exclusion is entirely contrary to the spirit of the Sex Disqualification (Removal) Act, 1919, and against public policy.

The need for maintaining the standard advocated by the British Medical Association of equal pay for equal work in the case of medical men and women was once more emphasised by the Council, in view of the danger of women being invited by public health authorities to accept a lower salary than is deemed essential for men. The Council considered that the infringement of this principle would be to the detriment of the profession as a whole, and is doing everything in its power to discountenance 'underselling" on the part of medical women. Amongst other subjects raised, that of birth control was prominent. A subcommittee was appointed to study the subject from all points of view, in order to ascertain the ultimate effects of birth control upon imperial health and welfare. Attention was drawn to the desirability, already recognised by many superintendents, of the employment of medical women in large mental hospitals in the interests of women patients.

THE LONG FOX LECTURE.—The tenth Long Fox Lecture will be delivered on Monday, Nov. 28th, at 5 P.M., in the Physiological Theatre of the University of Bristol, by Mr. E. W. Hey Groves, who will take as his subject the Repair of Bone Injuries. The chair will be taken by Sir Henry Gray.

BRISTOL MEDICAL SCHOOL: ANNUAL DINNER.—This dinner will be held on Monday, Nov. 28th, at the Grand Hotel, Bristol, at 7 for 7.30. Sir Henry Gray will be the guest of the evening, and Mr. W. R. Ackland will preside. It is hoped that old students will make a special effort to be present. The speech list is to be shortened, so as to allow old friends time to talk to each other. Tables of six or eight can be arranged on application to the Secretaries, Messrs. R. S. Statham and J. A. Pritchard at the Medical School.

SCALP RINGWORM IN BRISTOL SCHOOLS.—The Bristol Medical Committee has organised a series of meetings at which it has been addressed by the medical officers in charge of the various public services. At a recent meeting Dr. R. A. Askins, principal school medical officer, spoke of the urgent need for routine microscopic examination of children convalescent from scalp ringworm, prior to their readmission to school. The committee has therefore decided to inform every medical practitioner within the city that Dr. Askins has made arrangements for a microscopic examination of these cases on the completion of treatment.

INFIRMARY TRAINING FOR NURSES.—The Steyning board of guardians, at a meeting on Oct. 25th, discussed the desirability of the separation of the infirmary from the workhouse proper. The union, under the care of the board, includes the town of Hove, with a population of 46,519, and controls an area with a total population of some 111,000. One reason for the proposed separation is that in order to comply with the curriculum approved by the General Nursing Council the guardians will have to provide the means for improved training for nurses. The present training received by probationers is regarded as inadequate for the after-treatment of acute medical and surgical cases. A year ago a theatre was fitted up for minor operations, and arrangements were made for the reception of paying patients requiring such operations. A subcommittee has now been appointed to prepare a tentative scheme for ensuring the adequate training of nurses.

CERTIFICATION FEES IN IRELAND.—The Irish Medical Committee has been informed by the Irish Insurance Commission that it will be necessary in the immediate future to reduce materially the fees paid for certification under the National Health Insurance Act. At the beginning of 1920 the remuneration was increased by 40 per cent., as a temporary bonus, and as panel fees in Great Britain have now been reduced from the temporary figure awarded two years ago, the Treasury thinks fit to reduce similarly the remuneration in Ireland. It is not considered likely that the Irish Medical Committee will, on behalf of the profession, give its consent to reduction, and for any disturbance of work arising therefrom the Treasury will be responsible. If a reduction is made it will press particularly heavily on country doctors, many of whom have been deprived of a large proportion of their salaries by the diversion of the State health grants to extraneous purposes.

PUBLIC HEALTH IN ABERDEENSHIRE.—Conferences have recently taken place regarding the coöperation of the medical services in Aberdeenshire between representatives of Aberdeen County Council, Aberdeenshire education authority, the various district committees, the town councils, managers of joint hospitals, and the County Nursing Association, along with the various medical officers of these bodies. The representatives were of the opinion that a scheme of coördination of the public health services was highly desirable with a view to the prevention of overlapping and waste. The medical officers of health in the county and the burghs were asked to consider the question and submit a draft scheme to the committee. At a meeting of the medical officers there was some difference of opinion, less as to the desirability of coördination than as to the means of bringing it about. Dr. N. Davidson (M.O.H., Peterhead), who was appointed to consider the memoranda drawn up by the two parties, stated that both views submitted were laudable, but that the medical services of the county should be placed upon a broader basis with a view to obtaining progressive unification. At another meeting the committee decided to send a communication to all the district nursing associations, intimating the amount of the grants available for the services of nurses under the several county schemes. It was also decided that the education authority should endeavour to come to an arrangement with local authorities for provision of facilities at their hospitals for the cleansing of verminous children, clothing and bedding.

# Medical Diary.

## SOCIETIES.

ROYAL SOCIETY, Burlington House, W.
THURSDAY, Nov. 10th.—At 4 P.M. a Special General Meeting will be held to consider the Annual Report of Council.
List of probable papers:—K. Sassa: (1) Observations on Reflex Responses to the Rhythmical Stimulation in the Frog. (2) On the Effects of Constant Galvanic Currents upon the Mammalian Nerve-muscle and Reflex Preparations (communicated by Prof. C. S. Sherrington, P.R.S.). E. Ponder: The Hæmolytic Action of Sodium Glycholate (communicated by Sir E. Sharpey Schafer). Dorothy J. Lloyd and C. Mayes: The Titration Curve of Gelatine (communicated by Prof. F. C. Hopkins). D. H. de Souza and J. A. Hewitt: Idio-Ventricular Periodicity (communicated by Prof. W. D. Halliburton).

**ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.**

**Wednesday, Nov. 23rd.**

OCCASIONAL LECTURE: at 5 P.M.
Dr. Gustave Monod: Syphilis of the Stomach. A Discussion will follow in which Dr. A. F. Hurst, Dr. McNee, Mr. Herbert Paterson, and Mr. A. J. Walton will take part. There will also be an Exhibition of Specimens.

*MEETINGS OF SECTIONS.*

**Tuesday, Nov. 22nd.**

MEDICINE: at St. Thomas's Hospital, S.E. 1.
Tea at 4.15 P.M. Meeting at 4.45 P.M.
Clinical cases will be shown. Demonstration of Estimation of Basal Metabolism. Demonstrations of Methods of Estimating Liver Insufficiency and of Estimation of Blood-sugar.

**Thursday, Nov. 24th.**

UROLOGY: at the Cancer Hospital, Fulham-road, S.W. 3, at 2.30 P.M.
*Operations* by Sir Charles Ryall and Mr. Jocelyn Swan at No. 1, Wimpole-street, at 8.30 P.M.
*Discussion* on "Renal Function Tests."
Short Opening Papers will be read by: Mr. John J. Everidge, Mr. J. Swift Joly, Mr. J. B. Macalpine, Dr. MacLean and Mr. Cyril Nitch, Dr. Mackenzie Wallis and Mr. Girling Ball.
Sir Cuthbert Wallace, Dr. Langdon Brown, Mr. Frank Kidd, Dr. Marrack, Mr. G. E. Neligan, Mr. A. E. Webb-Johnson, Mr. A. Clifford Morson, and others will take part in the Discussion.

**Friday, Nov. 25th.**

STUDY OF DISEASE IN CHILDREN, at 5 P.M. (Cases at 4.30 P.M.)
Exhibition of Cases, &c.:—Miss Eva Morton: Report on a Fatal Case of Bullous Eruption. Other cases will be shown.

EPIDEMIOLOGY AND STATE MEDICINE: at 8 P.M.
*Paper:* Dr. J. P. Kinloch: Metabolism in Fevers.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Nov. 21st.—8.30 P.M.: Discussion on "The Arseno-Benzo Treatment of Syphilis." Introduced by Lieut.-Col. L. W. Harrison, followed by Prof. H. Maclean, Dr. J. W. McNee, Dr. R. L. Mackenzie Wallis, Dr. Henry MacCormac, and Mr. C. H. Mills.

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.
WEDNESDAY, Nov. 23rd.—8 P.M., Prof. J. A. Fleming: The Coming of Age of Long-Distance Wireless Telegraphy and Some of its Scientific Problems.
FRIDAY.—4.30 P.M., Mr. A. H. Ashbolt: An Imperial Airship Service.

## LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Nov. 21st.—2 P.M., Mr. Addison: Demonstration of Cases (Surgical Wards). Dr. Scott Pinchin: Medical Out-Patients. Dr. Morton: X Ray Department. Dr. Simson: Diseases of Women. 5 P.M., Dr. Arthur Saunders: Functional Dyspepsia (Lecture).
TUESDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations and Visit to Wards. 11 A.M., Dr. McDougal: Electrical Department. 12 noon: Mr. Sinclair: Appendicitis (Lecture). 2 P.M., Dr. Burrell: Medical Out-patients. 2.30 P.M., Dr. Pritchard: Demonstration of Cases (Medical Wards). Mr. Tyrrell Gray: Visit to Surgical Wards. 5 P.M., Dr. Scott Pinchin: Differential Diagnosis of Pulmonary Tuberculosis (Lecture).
WEDNESDAY.—10 A.M., Mr. MacDonald: Genito-Urinary Department. 12 noon, Mr. Simmonds: Demonstration of Fractures, &c. 2 P.M., Mr. Gibb: Eye Department. Mr. Donald Armour: Visit to Surgical Wards. 5 P.M., Dr. Owen: Diagnosis and Treatment of Renal Disease (Lecture).
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Mr. MacDonald: Surgical Out-patients. Mr. Donald Armour: Operations. 2.30 P.M., Dr. Arthur Saunders: Visit to Medical Wards. 5 P.M., Dr. Simson: Modern Developments in the Management of Labour (Lecture).

FRIDAY.—12.15 P.M., Dr. Burnford: Applied Pathology. 2 P.M., Mr. Sinclair: Surgical Out-patients. Dr. Pernet: Skin Department. Mr. Banks Davis: Diseases of the Throat, Nose and Ear. 5 P.M., Mr. Steadman: The Ætiology and Pathology of Dental Sepsis (Lecture).

SATURDAY.—10 A.M., Dr. Arthur Saunders: Medical Diseases of Children. Dr. Burnford: Visit to Medical Wards. 2 P.M., Dr. Owen: Medical Out-patients. Mr. Simmonds: Surgical Out-patients.

Daily:—10 A.M., Visit of Post-Graduates to Wards. 2 P.M., In-patient, Out-patient Clinics and Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Nov. 21st.—10 A.M., Mr. W. E. Tanner: Surgical Out-patients. 2.30 P.M., Dr. A. J. Whiting: Demonstration in Medical Wards. Mr. E. Gillespie: Surgical Operations. Dr. J. B. Alexander: Medical Out-patients. Mr. J. Bright Banister: Gynæcological Out-patients. Dr. Shanks: X Ray Department. 4.30 P.M., Mr. J. Bright Banister: The Relation of Heart Disease to Pregnancy, Labour, and the Puerperium. 7 P.M., Dr. F. L. Provis and Mr. T. H. C. Benians: Venereal Department.

TUESDAY.—9.45 A.M., Lt.-Col. R. H. Elliot: Eye Cases and Operations. 2 P.M., Mr. J. Howell Evans: Surgical Out-patients. 2.30 P.M., Mr. H. W. Carson: Surgical Operations. Mr. C. H. Hayton: Throat, Nose and Ear Out-patients. Dr. J. Metcalfe: X Ray Department. Dr. L. Yealland: Medical In-patients. 3 P.M., Mr. J. Howell Evans: Surgical In-patients. 3.30 P.M., Dr. F. G. Crookshank: Physical Examination of the Chest.

WEDNESDAY.—2 P.M., Mr. C. H. Hayton: Throat Operations. 2.30 P.M., Dr. J. B. Alexander: Medical Out-patients. Dr. W. Jenkins Oliver: Skin Cases. 5 P.M., Dr. F. L. Provis and Mr. T. H. C. Benians: Venereal Department.

THURSDAY.—2.30 P.M., Mr. J. Bright Banister: Gynæcological Operations. Dr. A. J. Whiting: Medical Out-patients. Mr. H. W. Carson: Surgical Out-patients. Dr. J. Metcalfe: X Ray Department. Mr. N. F. Fleming: Eye Out-patients.

FRIDAY.—2 P.M., Mr. J. Howell Evans: Surgical Operations. 2.30 P.M., Dr. C. E. Sundell: Children Out-patients. Mr. E. Gillespie: Surgical Out-patients. Dr. Shanks: X Ray Department. 4.30 P.M., Mr. E. Gillespie: The Treatment of Paralytic Deformities by Orthopædic Methods. 5 P.M., Dr. F. L. Provis and Mr. T. H. C. Benians: Venereal Department.

SATURDAY.—10.30 A.M., Mr. W. E. Tanner: Surgical Operations. 3 P.M., Mr. H. W. Carson: Visit to Surgical Wards.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART POST-GRADUATE COURSE, Westmoreland-street, Marylebone, W.

MONDAY, Nov. 21st.—11 A.M., Dr. Goodall: Out-patients. 2 P.M., Dr. Moon: In-patients. 5.30 P.M., Lecture:—Dr. Goodall: Auricular Fibrillation and Auricular Flutter.

TUESDAY.—10 A.M., Dr. Parsons-Smith: Out-patients. 10 A.M., Dr. Price: In-patients. 2 P.M., Sir S. Russell-Wells: Out-patients.

WEDNESDAY.—10 A.M., Dr. Parkinson, and 2 P.M., Dr. Moon: Out-patients.

THURSDAY.—2 P.M., Dr. Price: Out-patients. Dr. Moon: In-patients. 6.30 P.M., Dr. Hamill: Out-patients.

FRIDAY.—10 A.M., Dr. Parsons-Smith: Out-patients. 2 P.M., Dr. Parkinson: Out-patients. 3 P.M., Dr. Parkinson: In-patients. 4 P.M., Dr. Goodall: In-patients.

SATURDAY.—10.30 A.M., Dr. Hamill: In-patients.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, Nov. 24th.—4 P.M., Lecture:—Mr. H. Tyrrell Gray: Congenital Hypertrophic Stenosis of Pylorus.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.

THURSDAY, Nov. 24th.—6 P.M., Chesterfield Lecture:—Dr. W. Griffith: Common Forms of Dermatitis.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE CLINIC.

TUESDAY, Nov. 22nd.—4.30 P.M., Mr. F. H. Westmacott: Laryngeal Neuroses.

MANCHESTER FRENCH HOSPITAL POST-GRADUATE LECTURES, 24, Acomb-street, Whitworth Park.

THURSDAY, Nov. 24th.—Dr. A. C. Magian: Pelvic Inflammation.

ST. MARY'S HOSPITALS POST-GRADUATE LECTURE at Whitworth-street West Branch, Manchester.

FRIDAY, Nov. 25th.—4.30 P.M., Dr. Dougal: Ectopic Pregnancy.

ANCOATS HOSPITAL.

THURSDAY, Nov. 24th.—4.30 P.M., Dr. A. H. Holmes: "D.A.H." (Tachycardia, Its Ætiology, Treatment, and Prognosis).

UNIVERSITY OF SHEFFIELD—FACULTY OF MEDICINE. Post-Graduate Lectures and Demonstrations.

TUESDAY, Nov. 22nd. (At the Royal Infirmary).—3.30 P.M., Mr. E. F. Finch: Demonstration of Cases. 4.15 P.M., Dr. A. R. Hallam: X Rays in the Diagnosis of Diseases of the Chest.

FRIDAY. (At the Royal Hospital).—3.30 P.M., Dr. J. G. Wilkinson: Ear Emergencies. 4.15 P.M., Prof. J. S. C. Douglas: Serums and Vaccines.

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND, 11, Chandos-street, Cavendish-square, W.

TUESDAY, Nov. 22nd.—3.15 P.M., Quarterly Meeting:—Dr. M. Hamblin Smith: The Medical Examination of Delinquents. Dr. H. Davies Jones: Forgetting.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.

A Course of Eight Lectures and Discussions on Problems of Public Health in Relation to Industrial Hygiene at the Lecture Theatre of the Institute.

WEDNESDAY, Nov. 23rd.—4 P.M., Lecture VI.:—Dr. R. Prosser White: Do We Neglect the Industrial Skin Sufferer? (With Lantern Demonstration.)

# Appointments.

BARRON, H. T., M.D. Lond., has been appointed Clinical Assistant to the Skin Department at Westminster Hospital.

GEBBIE, N., M.D. Glasg., D.P.H., Medical Officer of Health for the Borough of Hyde, Cheshire.

HOOD, D. W. C., M.D.Cantab., Honorary Consulting Physician to the Royal Earlswood Institution for Mental Defectives.

St. Thomas's Hospital: SLAUGHTER, H. L., M.R.C.S., L.R.C.P. Lond.; MCCLEAN, D., M.R.C.S., L.R.C.P.Lond; WILLEY, H. L., M.R.C.S., L.R.C.P. Lond.; TALLERMAN, K. H., M.R.C.S., L.R.C.P. Lond; PHILLIPPS, F. A., M.B., B.Ch., Cantab; BURRELL, E. M., M.R.C.S., L.R.C.P. Lond.; HARTLEY, S., M.C., M.R.C.S., L.R.C.P. Lond.; SPIRA, J., M.R.C.S., L.R.C.P. Lond., Casualty Officers and Resident Anæsthetists. HAMILTON, C. K. J., M.B., B.Ch. Oxon.; GRANGER, E. D., M.B., B.S. Lond.; WHITELAW, A. D., M.R.C.S., L.R.C.P.Lond.; BACK, G. A., M.R.C.S., L.R.C.P. Lond., Resident House Physicians. KENDALL, G. M., M.D. Cantab., Resident House Physician for Children. TRACY, G. D. C., M.R.C.S., L.R.C.P. Lond.; LIANG, P. T., B.Ch. Cantab., D.T.M.; HUMFREY, S. H. G., M.R.C.S., L.R.C.P.Lond.; SQUIRES, F. V., M.B., B.Ch. Cantab., Resident House Surgeons. BROCKMAN, E. P., M.B., B.Ch. Cantab., Resident Orthopædic House Surgeon. CHURCHER, J. C., M.R.C.S., L.R.C.P. Lond., Resident House Surgeon for Ear, Nose and Throat. MAXWELL, L. B., M.B., B.Ch. Cantab., Senior Obstetric House Physician. CARDELL, J. D. M., M.R.C.S., L.R.C.P. Lond., Junior Obstetric House Physician. LOW, W. A., M.R.C.S., L.R.C.P. Lond., Senior Ophthalmic House Surgeon. SHAW, J. A. P., M.R.C.S., L.R.C.P. Lond., Junior Ophthalmic House Surgeon. CAVENAGH, J. B., M.B., Ch.B.Oxon.; WILLIAMS, B. W., M.R.C.S., L.R.C.P.Lond.; HACKWOOD, J. F., M.R.C.S., L.R.C.P. Lond.; WHITTING, C. E., M.R.C.S., L.R.C.P. Lond.; SHIRES, B., M.B., Ch.B. Edin.; PARSONS-SMITH, B. T., M.D. Lond., Clinical Assistants.

# Vacancies.

*For further information refer to the advertisement columns.*

*Altrincham General Hospital.*—H.S. £175.

*Bradford City.*—Asst. Bacteriologist. £600.

*Bradford City Municipal General Hospital.*—H.P. and H.S. Each £350.

*Bridgend, Glamorgan County Asylum.*—Jun. Asst. M.O. £415.

*Bridge of Weir, Consumption Sanatoria of Scotland.*—Res. Asst. M.O. £200.

*Brighton Education Committee.*—Female Asst. Sch. Doctor. £500.

*Brighton, Hove Hospital.*—Res. M.O. £250.

*Burslem Haywood Hospital.*—Res. M.O. £200.

*Bury Infirmary.*—Jun. H.S. £150.

*Cambridge, Addenbrooke's Hospital.*—H.P. £130.

*Canterbury, Kent and Canterbury Hospital.*—Hon. Ophth. Surg.

*City Dispensary, College-street, E.C.*—Vistg. M.O. £52 10*s.*

*Derbyshire County Council.*—Asst. Sch. M.O. and Asst. Tuberc. O. £600.

*Dumfries, Crichton Royal Mental Hospital.*—Clin. Path. £400.

*Durham, Richard Murray Hospital, Blackhill.*—Res. M.O. £400.

*Elizabeth Garrett Anderson Hospital, Euston-road.*—Female Radiologist. H.P. Two H.S.'s. and Obstet. Asst. Each £50.

*Frimley, Burrow Hill Sanatorium, &c.*—Res. Med. Supt. £600.

*Gloucester, Gloucestershire Royal Infirmary and Eye Institution.*—Asst. H.S. £150.

*Greenwich, Dreadnought Hospital.*—H.S. £150.

*Guildford, Royal Surrey County Hospital.*—H.S. £150.

*Hampstead General and North-West London Hospital, Haverstock Hill.*—H.P., H.S., Cas. M.O. and Cas. Surg. O. Each £150. Also Dermatologist.

*Ilford Urban District Council.*—Asst. M.O.H. £650.

*India, Countess of Dufferin's Fund.*—Three Medical Women. Rs. 450 per month.

*Ipswich, East Suffolk and Ipswich Hospital.*—Res. M.O.

*Iraq.*—Two M.O.'s. 600 to 1000 rupees per mensem.

*Lincoln County Hospital.*—Jun. H.S. £150.

*Liverpool Eye and Ear Infirmary.*—H.S. £150.

*Manchester, County Asylum, Prestwich.*—Asst. M.O. £528 18*s.*

*Manchester Royal Infirmary.*—Asst. M.O. and Asst. Surg. O. Each £35. H.S. £50.

*Margate, Royal Sea Bathing Hospital.*—S. £200.

*Middlesbrough, North Ormesby Hospital.*—Hon. S.

*Nottingham Children's Hospital.*—Female Res. H.S. £180.

*Nottingham General Hospital.*—H.S. £200.
*Oldham Royal Infirmary.*—Three H.S.'s. Each £200.
*Prince of Wales's General Hospital, Tottenham.*—Hon. Surg. Reg.
*Rhondda Urban District Council.*—Asst. M.O.H. £600.
*Royal National Orthopædic Hospital, Great Portland-street.*—H.S. £150.
*Royal Naval Medical Service.*—Surg. Lieuts.
*St. Mary's Hospital, Paddington, W.*—Med. Supt. £350.
*St. Peter's Hospital, Henrietta-street.*—Two Hon. Asst. Surgs.
*Samaritan Free Hospital for Women, Marylebone-road, N.W.*—H.S. £100.
*Shanghai Municipal Council.*—Asst. Health Officer. £1540.
*Sheffield Royal Infirmary.*—H.P. and Asst. Cas. O. £150.
*South London Hospital for Women, Clapham Common.*—Female Temp. Asst. P. Also Clin. A.
*South Mimms, Clare Hall Sanatorium.*—Asst. M.O. £350.
*Staffordshire General Infirmary, Stafford.*—H.S. £250.
*Stockport Union.*—Res. Asst. M.O. £275.
*Ventnor, Royal National Hospital for Consumption.*—Asst. Res. M.O. £300.
*West Malling, Malling Union.*—Dist. M.O., &c. £218.
*West Riding County Council School.*—Oculist. £600.
*Winchester, Royal Hampshire County Hospital.*—H.S. £150.
*Worcester County and City Mental Hospital.*—Sen. Asst. M.O. £500.
*York County Hospital.*—H.P. £150.

# Births, Marriages, and Deaths.

## BIRTHS.

DIXON.—On Sept. 28th, at Trong, Federated Malay States, the wife of William John Dixon, M.B., M.R.C.S., L.R.C.P., of a son.
UPCOTT.—On Nov. 3rd, at Cheriton House, Hull, the wife of Harold Upcott, F.R.C.S., of a son.
VERNON.—On Nov. 12th, at Wordsworth Lodge, Shirley, Southampton, the wife of Dr. R. J. Vernon, of a son.

## MARRIAGES.

DAVIS—BLACKWELL.—On Nov. 5th, P. G. Stevenson Davis, M.R.C.S., L.R.C.P., to Amy E. Read Blackwell, second daughter of the late Alfred R. Read Blackwell and of Mrs. Blackwell.
WISE—DIXON.—On Nov. 11th, C. E. Wise, M.D., M.R.C.S., L.R.C.P., to Phyllis D. Dixon, M.B., B.S. Lond.

## DEATHS.

COOKE.—On Nov. 9th, at Hampden House, Town Walls, Shrewsbury, from pneumonia, Ernest Wilfrid Cooke, M.R.C.S., L.R.C.P., aged 51.
DELÉPINE.—On Nov. 13th, at 41, Palatine-road, Withington, Manchester, Prof. Sheridan Delépine, Director of the Public Health Laboratory, Manchester, aged 66.
FENWICK.—On Nov. 10th, at Long Framlington, John Charles James Fenwick, M.D., J.P., aged 76 years.
HORSLEY.—On Nov. 8th, at Poplar-walk, Croydon, Henry Horsley, M.R.C.S., aged 83.
ROTH.—On Nov. 11th (suddenly), at Villa Elise, Boulevard d'Italie, Monte Carlo, Felix Norman Roth, F.R.C.S. and L.R.C.P., aged 65.

*N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.*


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THE town of Halle has presented Prof. Emil Abderhalden with the sum of Mk.100,000 for carrying out scientific studies in recognition of his refusal to accept a professorial chair at Basle.

Dr. James Bates Wilkinson has been appointed a Knight of Grace, and Surgeon Commander Edward Aubrey Guy Wilkinson, R.N., an Esquire of the Order of the Hospital of St. John of Jerusalem in England,

# Notes, Short Comments, and Answers to Correspondents.

## THE SIGNIFICANCE OF THE SEXUAL INSTINCT FOR ANTHROPOLOGY AND PSYCHO-PATHOLOGY.

BY IAN D. SUTTIE, M.B., B.CH. GLASG.

IT is still objected that Freud attaches undue importance to the sex instinct in his ætiologies and theories of "culture." A mere conflict of observation on this point would resolve itself in time, but since disagreement extends to the very method of study, it seems worth while to seek a point of view independent of either position. These considerations, therefore, though a priori, have the advantage of impartiality, and do not involve the imputation of motive to either of the disputing parties. As regards ætiology, the charge of exaggerating the pathogenic potentiality of sex seems to me to imply also that of ignoring the significance of other motives, such, for example, as fear. I find no basis for this charge; as Freud's psycho-pathology allots to fear the dominant rôle. This does not seem to be generally realised, even by Freud in defending himself, but it is so. Fear (of punishment, reproach, &c.) is at the root of every repression, an essential factor in the endopsychic censor, and of greater power than the material it ejects. Indeed, from an altered point of view—a standpoint intellectually, if not ethically, truer—it is possible to regard the censor as the disease, and fear, disgust, &c., as the pathological reactions. Psycho-analysis may, then, have misconstrued the signficance of sex, but it certainly has not ignored the self-preservative motives.

### *"Instinct of Self-Preservation" Strictly a Misnomer.*

It is apt to be forgotten that sex is by far the most powerful single instinct, and this oversight is, perhaps, partially due to the misapplication of the term, "the instinct of self-preservation," which is frequently taken to mean an instinct in the strict sense, as, for example, the sexual instinct. It is obvious that there is no such thing as an instinct of self-preservation—that the term applies only to a biological category of behaviour, a descriptive abstraction, and not to any organised psycho-physical disposition capable of exerting all the energy of its many powerful components as one unified motive. On the contrary, the manifold interests and activities, which happen to subserve at certain times and in certain circumstances the general purpose of the preservation of the organism, have nothing in common beyond this ultimate result. For example, the defensive emotions fear, anger, and disgust are as essential to life as the nutritional impulses, yet are independent of and even incompatible with them.

Even McDougal apparently lends support to the fallacious method of classifying behaviour according to the biological function it seems to fulfil, and then seeking to substantiate that classification in the psychic and physiological spheres—to discover psychological mechanisms corresponding to these utilities. Simple impulses, appetites, and the reflexes are activities probably equally definite subjectively and objectively—as conduct and as psycho-physical dispositions—but that is because we have no chance of making an abstract and irrelevant (teleological) classification. There is no a priori reason for supposing the emotion of disgust, and its physical basis, for example, to be more closely associated with other defensive reactions than with the sex impulses which protect the race.

### *The Sex Instinct.*

The sex instinct is itself complex, but relatively synthetised, and should be compared only with equally organised impulses. If this is done it will be found: (1) That it is an appetite, therefore, to some extent, independent of external stimulation, and at the same time positive, not avertive; (2) that it is late in appearing and later still in attaining fixation by function, being unique in its period of non-functional activity; and (3) that, unlike the vital activities which must be efficiently performed from birth (on penalty of extinction) the sex instinct seems dependent more on mind and less on automatic impulse, and to undergo a long and elaborate psychogenesis rendered possible by this circumstance. It is obvious that the impulses of vital functions can never be diverted from their goal (perverted or sublimated—the difference is one of value) while natural selection might permit the development of a considerable uncertainty in the sexual, or other spheres of activity, unessential to individual existence. (4) It appears to me to be true that of all powerful instincts the sexual is most extensively applied in play. Perhaps it may owe most to a development under this exercise (as Groos supposes other

instincts to do). However, that may be, if we take song, fiction, drama, art, &c., as play exercise of emotion there is no doubt that the sex motif is always well represented.

These considerations seem to me to point to the conclusion that the energy of the non-sexual impulses is occupied ab origine in the proper functions, while sexuality is the only important source of a surplus of free adaptable psychic energy. This has equal importance for the psychopathologist and the anthropologist, and I cannot see any inherent improbability in Freud's empirical findings. For the same reason, and because of the characteristics pointed out above, the sexual instincts appear to be much more significant for psycho-pathology than the relatively stereotyped and canalised impulses that are vital to the individual.

*Sex in Social Life.*

One of the biological values of the social habit is that it ensures the meeting of mates at mating season, and thereby makes less demand upon the sexual impulse. There are two psychic pre-conditions of social life: (*a*) That individualistic instincts should be adjusted harmoniously—sex rivalry is the usual determinant of cleavage—and (*b*) that members of the community should possess a margin of interest beyond that fixed in the service of their individual vital needs. This adaptable surplus may theoretically proceed from any of the instincts, or may be unspecialised ab origine. It seems more probable, however, that it attains its functional employment via the natural (instinctive) channels by a play adaptation. One aspect of the problem is, what proportion makes use of sexual channels, and how?

That sex is in some way the crucial factor in communal life might be suspected from the remarkably clear-cut way in which existing societies may be classified on a sexual basis, and from the definite divergence of type and tendency shown by the groups so discriminated. Of course, the factors of original endowment and adaptability of instinct are of overwhelming importance when comparing the habits and mode of life of insect and mammal; but the point to which I wish to draw attention appears quite clearly within the group of mammal societies. All I desire is to call attention to three types of gregariousness and to show a coincidence between their "culture tendency" and their sexual organisation. (1) Many species form temporary associations, as, e.g., during migrations, which have a unity beyond that of similar reaction to similar circumstances, which may even group members of different species. Such associations achieve none of the permanent constructive purposes of social life; their integration usually gives way on the return of the interests of the mating season. They are asexual communities. (2) The most conspicuous type of community is the sexual unit, the family, where one sex is represented by only one active member. (3) Societies proper, where several families live permanently together with common interests pursued in common.

The first type is not important except as a possible origin for more elaborate forms. From the contrast between the next two we can form some idea of the significance of sex for society. Especially is this apparent when we observe that man is the only species that has truly created a society of the latter type, and that even yet he cannot be said to have established any form whose harmony with his own nature guarantees its permanence. Of the second (familial) type of community there are two distinct forms: the "hive" centring round one functional female, and the "herd" centring round one male. Only insect fecundity can render the former possible; in mammals the reproductive function claims most of the energy of most of the females. Both types of community waste the male sex, by killing, or expelling to live solitarily, most or all of their males. The "herd" consists of sexual individuals, although (after elimination of males and owing to female fecundity and to the power of organic specialisation) the insects can still set aside for social purposes a class deprived of the impulse leading to sex rivalry, while yet retaining the constructive and unselfish "maternal" instincts. This (familial) type of social organisation does not require or achieve (in any phylum) any control of jealousy, any harmonisation of sex rivalry; queens and bulls alike fight to the death or split the community. The stereotypy of insect instinct of course forbids progress here, but the herd has shown an equal incapacity.

For both of these forms of "family" community, then, the unifying biological purpose and the social organisation is sexual. In this respect and in the absence from the "herd" of sexually functional but underfunctioning individuals, they differ from human society, a circumstance agreeing with Freud's Theory of Culture.

*Imperfect Specialisation of Mammals.*

To obtain services similar to those rendered to their communities by insect "workers," mammals (owing to limited fecundity and long infancy) must utilise their males. In one sense this is an economy, but the material seems to be refractory, perhaps owing to lack of maternal instinct. Again, in default of the unique insect capacity for organic specialisation, this must take the form of an adaptation of interest, which at best can only be gradually and partially accomplished by upbringing. The work or culture interests must be imposed, artificial, and always making headway against the counter-attraction of primitive sex interest and the temptations of play and repose. For the same reason (imperfect specialisation) mammalian communities cannot transcend the "family" organisation without overcoming and perpetually resisting the disruptive tendency of sex rivalry.

*Survival Value of Social Habit.*

Both of the psychic preconditions of society-building—the securing of harmony and of surplus adaptable energy and interest—are thus bound up with the assimilation and utilisation of the reproductively irresponsible male sex, and the harmonious direction of their surplus energies into socially useful channels—i.e., the main problems of society are sexual problems. It cannot be argued that man's pre-eminence is solely due to his organic endowment, for without his social habits these would have little survival value. We must rather conceive that structural variations and social development have facilitated mutual growth by a process of organic selection.

*Development of Intellectual Intercourse.*

Though lacking the unity and stability of the "family" organisation, human society has gained the potentiality of variation and progress, and has, in addition, the advantage of utilising the entire species without mutilation or stereotypy of the individual. The combination of "family" or sexual units into a "social" unit, besides permitting an increase in the size of the community unhampered by reproductive considerations, introduces an important modification into the affective relationships of its component members. It substitutes for reciprocity of interest, based on complement of function, a parity or identity of interest that is, to my mind, the basis of intellectual development. For the development of language, and hence of conceptual intellect, intercourse is necessary between individuals with the same interest in the same objects, who have an identical, not a reciprocal affective world outlook. Language and thought are strictly coöperative activities; they can only be developed between companions with the same objective interest. Complementary interest reduces intercourse to a minimum, indeed it is a specialisation of interest that divides, that prohibits understanding. Of course, the mutual interest of the sexes in each other carries no possibility of thought or language development.[1] The conditions of the origin of language and thought are the intercourse and coöperative activity of a number of individuals with objective interests, which interests are at once adaptable and similar in tendency. These conditions are only fulfilled in a society as here defined and studied.

We conclude, then, that the social habit has a sexual value, that its evolution has been through the sexual to the polysexual unit-organisation, that its fundamental condition has been the limitation and adjustment of the sex interest and claims. If we still cannot allow that the impulses of sociability have a sexual origin, and that diverted sex interest is the motive of culture, we must still recognise that the development of society in all its diverging lines centres round the sex instinct, which, if not its stimulus, plays a no less significant part as its opponent. In opposition, if not in conjunction, sex is the basis of society. As environment, without directly influencing organisms, can yet by selection ensure their adaptation to itself, so sexuality even without acting as a creative interest, may impress itself upon every institution of every society. Sex regulation is the prime necessity of social life; what wonder that surviving forms of society should bear such traces of this adaptation that it is difficult to say whether they have been moulded by or moulded upon the sex instinct? In either case sex is the crucial factor for sociology, and institutions such as exogamy attest the difficulties overcome.

[1] Though there is reason to believe sex interest to be highly adaptable, yet it is, emphatically, only highly adaptable under conditions of obstructed functioning. In its simple form, with the "vital series" unimpeded, no transformation or deviation is conceivable from the stereotyped instinctive channels. The tension of sex interest (potential stimulus to thought and activity) is then inconstant, and even when high, unfavourable to indirect and elaborate expression as in thought activities, since it tends essentially to emotional expression. Furthermore, sex has no variety of common external objects and sequences which serve as the bases for general ideas and require intellectual understanding rather than practical mastery; its practice requires no elaborately devised technique and certainly no coöperative labour. These circumstances, which are lacking in the sphere of simple sexuality, are the conditions of the development of intellect, and it is probably appreciation of this fact which makes Freud's attribution of culture to a sexual energy-source seem so incredible. It should be understood, however, that the recognition of the above-mentioned considerations is not incompatible with the psycho-analytic position.

I have had no occasion to make use of the concept, "herd instinct," and have no space to deal adequately with it, though, as in some sense an alternative explanation, it must be noticed. As Trotter uses it (i.e., to correlate sociable feelings with social conduct) the notion may have some heuristic value, but the term certainly does not refer to any true or possible instinct in the accepted usage. As an induction in the phenomenal sphere of behaviour it is merely a descriptive abstraction, if not an essential proposition, which has been arrived at by a process similar to that responsible for the equally mythical "instinct of self-preservation." Here, as in this latter case, the economic ideal of induction demands a single psychological explanation for all social behaviour, for all communal organisations; and the uncritical imagination proceeds forthwith to supply a verbal one. Herd conduct is due to herd instinct, what more does one want to know? Nevertheless, a proper analysis of communal organisations throughout the animal kingdom displaying differences of sex relationships, organic desexualisation and other phenomena, bespeaks so radical a difference in the instinctive bond of union that we shall no longer feel justified in postulating a single instinct to supply an identical motive for modes of conduct really so dissimilar. Reasoning from these correlated divergencies of sex-relationship and social achievement, one should rather attempt to display the varying characters of societies as due to the varying constraints and adaptations they impose upon this fundamental and universal instinct, or upon those others of whose universal existence and power we have independent knowledge. In this way we can refer an indefinitely large proportion of social phenomena to the interplay of known motives, and refuse to allow any field to be pre-empted by such an hypothesis as that of herd instinct. The matter requires special discussion.

If my presentation appears dogmatic, disconnected, and one-sided I must plead considerations of space. My object is merely to advance certain considerations displaying the social and psychopathological significance of sex from a standpoint outside that of clinical (empirical) psychology.

## INDUSTRIAL MICRO-BIOLOGY.

THE Cantor Lectures to the Royal Society of Arts, delivered at the end of last year by Mr. A. C. Chapman, F.R.S., on Micro-organisms and Some of their Industrial Uses, have now been reprinted as a small pamphlet (F. J. Parsons, Ltd., 329, High Holborn, London, W.C. Price 2*s.*). While there is little that is actually new in the lectures, the author has done considerable service by once more drawing attention to the vital dependence of industry upon science and the application of scientific facts and to the fact that this scientific study has lagged in this country. His essential thesis is that "as chemists we shall—for a long time at least—become more and not less dependent on the powers (both synthetical and analytical) of living cells, and that it behoves us to study carefully the conditions which affect the activities of these cells, and which may even induce them to function in one direction or another at will." He illustrates this and other points by a lucid discussion of the mechanism of alcoholic fermentation, the production of glycerine on a large scale by the fermentation of sugar, the use of moulds to convert starch into sugar, the biochemical production of citric, lactic, and other acids, the manufacture of vinegar, the bacterial production of acetone and butyl alcohol, and in a number of other processes described in less detail.

*Production of Acetone.*

The national importance of the correct interpretation and use of scientific facts is very well illustrated by the production of acetone. Prior to the war the acetone required was manufactured from the acetic acid derived from the destructive distillation of wood and was nearly all imported. The greatly increased demand (for cordite and aeroplane dope), and the restriction of outside supplies stimulated the practical development of a scientific fact known for many years. By means of the fermentative action of a special bacillus, which under suitable conditions can produce butyl alcohol and acetone from starch, it was possible to develop the production of acetone by this biochemical action on a commercial scale.

A subject of considerable interest to medical readers is the utilisation of yeast for human food. The author states that from 50,000 to 60,000 tons of pressed yeast are produced per annum in the breweries of the United Kingdom, the great bulk of which is in the nature of a waste product. He discusses the use of this dried yeast as a food product both for man as well as animals and some of the scientific difficulties which have been overcome. He points out the superiority of yeast extract over meat extract as regards the presence of accessory growth-promoting substances.

*Potential Activities of Yeasts.*

Very considerable emphasis is laid upon the extremely important scientific fact that the chemical activities of micro-organisms may be made to vary widely according to the conditions under which they are compelled to function. For a good many years the production of alcohol, carbon dioxide, glycerine, and succinic acid in roughly definite proportions has been regarded as a fixed and characteristic property of yeasts. This is due to the fact that yeast has always been studied under a certain set of conditions. By varying these conditions it has been found possible to increase the percentage of glycerine produced from the normal 3 to 7 or 8 per cent., and later, by further developments to as much as 36 per cent. In other words, by varying the environment the response of the yeast cell was so altered that the products of its action upon sugar was entirely varied and it was made to produce glycerine upon a commercial scale. The German army authorities organised a company which at one time was making by this process as much as a million kilogrammes a month.

*Need for a National Institute.*

Mr. Chapman concludes his lectures by pleading for the establishment of a National Institute of Industrial Micro-biology. Such an institution would serve for the systematic prosecution of original research, as a centre for the specialised training of men intending to devote themselves to the teaching of micro-biology and biochemistry, for the practical instruction of factory managers and technical employees, and as a source of supply to the technical industries of the necessary organisms in pure culture. It is difficult to think of any institution likely to be of more benefit to British industry, and, taking the long view, its establishment would be a real contribution to the prevention of unemployment.

## PUBLIC HEALTH IN TRINIDAD AND TOBAGO, 1919.

THE report on medical affairs in Trinidad and Tobago during 1919, recently published, is submitted by Surgeon-General K. S. Wise, who took over the duties from Dr. F. A. de Verteuil in August. It is satisfactory to learn that difficulties such as have been encountered in regard to understaffing of the Colonial Hospital at Port of Spain are not likely to recur, as the staff has been strengthened on a liberal basis and in conformity with modern views. Accommodation is afforded for 340 patients, but during the year this number was almost constantly exceeded, the most numerous diseases treated being venereal affections (412), enteric fever (311), pulmonary tuberculosis (257), malaria (250), acute and chronic nephritis (240), and ankylostomiasis (208). Dr. R. Scheult, the resident surgeon, draws attention to the increase in cases of malignant disease during recent years, the admissions having risen from 38 in 1910–11 to 83 in 1919. The cancer deaths in the colony per 100,000 living have risen from 6·9 in 1898 to 33 in 1918. In a very large proportion of the cases admitted the disease was so far advanced as to render operation hopeless. It is suggested that there should be a wide distribution of leaflets giving a concise outline of the facts in connexion with the disease, and explaining the need for early treatment. At St. Ann's Lunatic Asylum the average number under treatment was 654; the percentage of recoveries was 30·76; of the 169 admissions 87 were male and 82 female, 73 were "labourers" (male or female), 32 were "of no occupation," 11 were housewives, and 11 servants. At the Leper Asylum the average number in hospital was 543, and the total number treated 686, the deaths numbering 57, or 8·3 per cent. of the number treated. Hypodermic injections of gynocardate of soda have been carried out by Dr. S. D. Stewart and others. Dr. Charles Howatson, the medical superintendent, considers that "although the general health of those thus treated appears to be much improved, any real improvement resulting therefrom cannot at present be said to be marked. In some cases stains and anæsthetic areas have been favourably affected. One patient who had great difficulty in using her fingers can now work with them as she had never done before. The treatment seems to be of more benefit to anæsthetic cases." At the St. Augustine Yaws Hospital there were 1455 admissions, an increase of 156 on the number for 1918; the number of individual *cases* was 857 (compared with 879 in 1918); the average duration of stay in hospital was 42 days, and the daily average number present 166. Arsenobillon, diarsenol, and neodiarsenol were used by intramuscular injection. Dr. J. A. Perez, medical superintendent, considers that the results on the whole have been very satisfactory. Out of 10,045 cases treated since salvarsan and its substitutes have been in use the percentage of recurrence has been only 4·8. Dr. E. Hamel Smith, reporting on the Yaws Hospital at Tobago, states that "the arsenobillon treatment gives good results."

*Report on Health Conditions, 1919.*

From a further report by Dr. C. F. Lassalle, Assistant Medical Inspector of Health, we learn that the population of Trinidad and Tobago in the middle of the year 1919 was estimated at 384,247, that the birth-rate was 30·1 per 1000, the death-rate 24·46, and the infant mortality ratio 155 per

1000 births. The birth-rate is lower than in either of the three preceding years 1916–18, in which the ratios were 32·36, 33·46, and 31·02 respectively. The death-rate (24·46) is higher than in either of the same three years (20·44, 21·25, and 21·70), as is the infantile mortality ratio. Enteric fever (729 cases and 203 deaths) was less prevalent than in 1918 (1011 cases and 248 deaths), the mortality ratio being 5·2 per 10,000, as compared with 6·5 in 1918; nearly half the cases occurred at Port of Spain, where the disease was endemic throughout the year. Tuberculosis mortality (13·11 per 10,000) was less than in the three years preceding (15·4, 13·5, and 14·4 per 10,000); nearly half of these deaths (240 out of a total of 504) occurred in Port of Spain. Malaria was prevalent throughout the year, and the resulting mortality, 26·21 per 10,000, exceeded that of either of the three years preceding (17·35, 19·78, and 22·00). Anti-malarial measures were carried out in various districts, and a spleen census taken of 18,145 children in elementary schools; this showed a percentage of 7·60 enlarged spleens, a considerable improvement on the findings in 1913–18, when the respective percentages had been 17·91, 14·11, and 11·20. Ankylostomiasis (7·86 deaths per 10,000) was more prevalent than in either of the three preceding years (6·82, 6·39, and 5·56 per 10,000). The Central Board of Health recommended that it should be made a punishable offence "to deposit human excreta or to defæcate anywhere except in a properly constructed privy in any district within a quarter of a mile of any occupied building." Influenza caused 332 deaths, compared with 46 deaths in 1918 (8·6 per 10,000 compared with 1·1 per 10,000); there were also 1034 deaths from bronchitis and pneumonia (26·9 per 10,000) in 1919, compared with 738 (19·2 per 10,000) in 1918, due to the same epidemic. Dr. Lassalle concludes his report by emphasising the importance of (1) the elimination of mosquito-breeding grounds; (2) the provision of pure water and food-supplies; (3) the provision of proper sanitary conveniences; and (4) the prevention of soil pollution in the vicinity of houses.

## LADY HENRY SOMERSET MEMORIAL.

IT has been proposed that the most fitting memorial for the late Lady Henry Somerset would be to place the Homes which she established, and to which she devoted her life, on a firm financial basis, free from every encumbrance that might fetter their usefulness. The work done in the Babies' Haven and Industrial Farm Village, at Duxhurst, near Reigate, is of the greatest national importance, but funds and accommodation are so badly wanted that those in charge are obliged to refuse a great many applications for admission per month. The Homes for Inebriate Women have proved equally invaluable; Lady Henry Somerset's perseverance, in the face of much pessimism concerning the possibility of reclaiming women drunkards, has resulted in the cure of 70 per cent. of victims received at the colony. The Duchess of Leeds, Lady Clarendon, and Lady St. Cyres point out in their appeal for funds that the expense of work done at Duxhurst would, but for the existence of these institutions, fall on the rate-payer in the shape of upkeep of workhouses, prisons, and reformatories. There are no endowments, and subscribers are urgently needed. H.M. Queen Alexandra takes a very personal interest in Duxhurst and has expressed the wish that this special appeal may meet with the highest success.

Donations and subscriptions should be forwarded to the Hon. Treasurer, Mr. Ernest J. Wythes, Industrial Farm Village, Duxhurst, near Reigate, Surrey.

## JANE HALL MURRAY BED.

AN invalid's convertible bed, couch, chair, and bath-chair, invented and patented by Mrs. Jane L. W. Murray, was exhibited for demonstration at the College of Ambulance, 56, Queen Anne-street, London, W., on Oct. 26th before an interested audience. The combination is designed to allow invalids to have many changes of position without exertion on their part, and to enable them to be moved from their rooms or to be taken outside without requiring to leave their beds. The bed-chair rests on four wheels. It is convertible at will from a bed to a couch, from a couch to a chair, and from a chair to a bath-chair, and back again. The means for effecting these conversion movements are ingenious but simple, and the operations can be performed by an attendant from either side of the bed. The bed is fitted with other appliances for giving ease and comfort. The patient may be raised from the prone position to that of sitting up, by the elevation of a section. An attachment for holding a tray also forms a reading or writing desk. The legs and feet of the patient can be raised. Bearer handles enable the patient to be carried. A canopy with celluloid windows and a waterproof apron and sheet form part of the equipment.

The Murray bed appears to us to be a valuable addition to the means of transport of invalids; and especially of those who suffer from ailments forbidding movement. These patients can be wheeled into the open, conveyed from house to house, from home to hospital, whether the weather is wet or fine, or taken for a journey in a railway van without being moved from their bed. Applications for the apparatus may be made to Mrs. Murray, at Dundarach, Craiglockhart, Midlothian, Scotland.

## THE BLIND AND SMOKING.

*To the Editor of* THE LANCET.

SIR,—There is a very general idea that blind people are quite incapable of enjoying tobacco. I always imagine this idea arises from the fact that when a smoker who can see is smoking in a train which plunges into a tunnel he quite loses his sense of appreciation for the brief period during which he is in darkness. Some years ago I used to travel very frequently through the long Merstham tunnel, and I remember having, over and over again, looked at the end of my cigar to make sure it was alight.

The failure to appreciate tobacco in the dark undoubtedly arises from the fact that sight is not only the most useful of the senses, but is the dominating sense, asserting itself over all the others. Once this dominating influence is lost the other senses assert their individuality and carry on their functions independently of their former master. I smoked a great deal before my sight left me. I smoke a great deal still, and I am pretty sure that I enjoy my pipe or cigar more than I used to. Though it is, of course, true that a blind man misses the delightful sight of the curling smoke, his increased appreciation of the flavour of tobacco in my opinion more than makes up for this. The men of St. Dunstan's who smoke—that is to say, the vast majority of St. Dunstaners—would, I am certain, almost unanimously agree with me, and so would many blind civilian smokers whom I know. A pipe-smoker keeps his pipe going very largely by the sense of sight, and at first pipe-smoking without the aid of this sense is apt to result in the constant letting out of the pipe or the smoking of it so furiously that the bowl gets almost red-hot. But this is only a phase, as are many other things which people do clumsily when their sight first leaves them, but in the case of which practice makes perfect.

With regard to the popularity of various kinds of smoking among blind people, I should say that the pipe is the least popular, probably for the reason that I have just given. Cigarettes, of course, are the most popular form of smoking among the blind, as they are among the rest of the population. Those who care for cigars, and can afford them, find just as much pleasure in them as others do in the pipe or cigarette.

I am, Sir, yours faithfully,

St. Dunstan's, Nov. 11th, 1921. ARTHUR PEARSON.

## THE PATIENT'S STANDPOINT.

THE following account of a hospital, by a 32-months' patient, appears in the October number of the *King's College Hospital Gazette*:—

"A hospital is a collection of corridors and stairs supported by slippery floors and contributions. A ward is a room attached to a corridor. It contains nurses, beds, patients, and fresh air in large quantities. A bed has longitude but no latitude. Its real duty is to beautify the ward. To disarrange a bed is a criminal offence. It is a far, far better thing to have a tidy bed than to be comfortable. A patient is the victim of circumstances—a conspiracy between the doctors and hospital authorities. After he has bided awhile he realises why he is called a patient. A nurse is essential for the proper running of the ward. Her chief duty is to watch patients in order to wake them when asleep. . . . . A clinical thermometer is a morbid cold-blooded instrument which requires a hot-air bath twice daily. The radiant heat necessary is provided by the patient. A chart is a piece of paper clipped to a board hanging on your bed. It is provided so that specialists can play noughts and crosses with the students. Has often been mistaken for an underground railway map, but is really the life story of a thermometer set to music. . . . The medicine cupboard contains brandy and castor oil. Tremendous quantities of each are used. The brandy is used to camouflage the castor oil and is also used as a restorative when patients feel faint. No patient is ever allowed to feel faint! Screens are used by the nurses instead of Sandow's Developer and are considered part of their uniform when on duty. No nurse is allowed to take a screen with her out of the ward when off duty. Most screens do not screen. Night commences when the blinds are pulled down—day commences when the night nurses have finished their midnight meal. Old patients sleep in the daytime—it is quieter. Lockers are a hospital version of dining-room sideboards. Always placed so that a patient cannot get at them, and really provided to gratify the nurses' curiosity. Lockers do not lock!"

The comment, if caustic, is not wounding to any particular institution, for the picture is wilfully drawn out of perspective, and hospitals can be made homely without diminution of efficiency.

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*W. R.* is thanked for his communication which will be brought to the attention of the writer of the note in question.